NOVEMBER 3, 1952

STEEL

THE WEEKLY MAGAZINE OF METALWORKING

TOTAL GAS INDUSTRY CAPITAL EXPENDITURES

1947-1951
$5.1 BILLION

1952-1956
$5.6 BILLION

A Big Field for Metalworking

—see p. 74

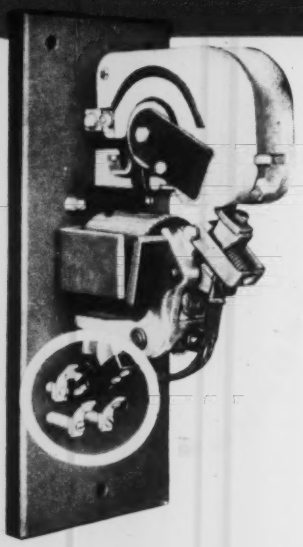
S O S TO OPS
Need for Price Relief Rises, p. 63

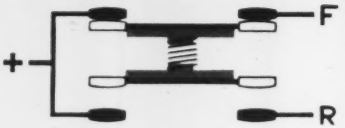
EFFICIENT SMALL PARTS CLEANING
Ultrasonics Gets Tight Spots, p. 92

BIGGER TOOL STEEL BARS MADE
Brittle Areas Disappear, p. 96

CONTENTS — PAGE 5

Safer Electrical Interlocking on All EC&M LINE-ARC CONTACTORS





Two sets of double-break contacts — isolated from each other — no carry-over from one to the other by an arc.

A Good Reason for Specifying E C & M Magnetic Control

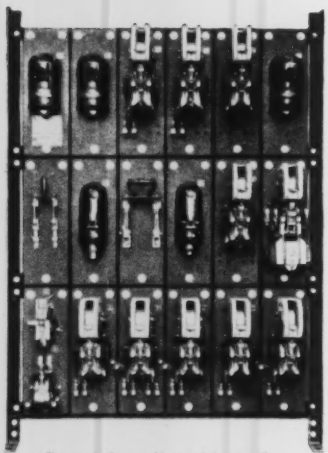
Magnetic contactor controllers use electrical interlocks to maintain safe motor connections, to regulate sequence of contactor operation, and for other important functions that promote efficient operation of motors or of control or of both motors and control.

On controllers using the EC&M *improved* LINE-ARC Contactors, a NEW Interlock provides *safer* interlocking with *lower* maintenance. The new upper and lower stationary contacts have double-faced contacts which can be moved from one position to the other for double the wear.

Movable contacts, carried in an insulated slotted frame attached to the contactor arm from the front, are easily inserted or removed without tools. The normally-open contact bridge is *isolated* from the normally-closed bridge by two insulators (shown in red in the sketch above). These insulators keep the spring in alignment and *prevent* the spring from carrying current from one bridge to the other.

Coin-silver contacts are used on these new electrical interlocks. With two movable contact bridges (instead of one previously used) and each *isolated* from the other, normally-closed circuits *cannot be carried over* by an arc to *normally-open* circuits or vice versa.

Safer electrical interlocks — a good reason for specifying EC&M Magnetic Control.



Typical Crane Hoist (Wright Circuit) Controller with improved *LINE-ARC* Contactors.

THE ELECTRIC CONTROLLER & MFG. CO.
2698 EAST 79TH STREET • CLEVELAND 4, OHIO

In Selecting Spring Steel

It's the Size of Section that Governs the Analysis

The size of a spring section is the factor that often determines the grade of steel for a given spring application.

It is considered sound practice to use a grade whose alloy content is consistent with the thickness of the finished section. A steel of medium or low alloy content will generally be adequate for use in a thin spring section. Heavier springs, on the other hand, take steels of richer alloy content to quench out properly.

Although this principle may sound simple, it calls for a careful study of spring sizes, stresses, forming methods, and heat-treatment. In this connection we will be glad to help. Our metallurgists will give you unbiased advice based on their familiarity with all grades of spring steels.

When you are in the market for alloy steels, remember that Bethlehem manufactures all AISI grades as well as special steels.

SPRING WEIGHT	*ANALYSIS*
Light Spring Sections	**9255**
	5150
	4063
	TS 8160
Medium Spring Sections	**6150**
	8650
	9260
	TS 8650
Heavy Spring Sections	**9262**
	8655
	TS 8655

BETHLEHEM STEEL COMPANY

BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

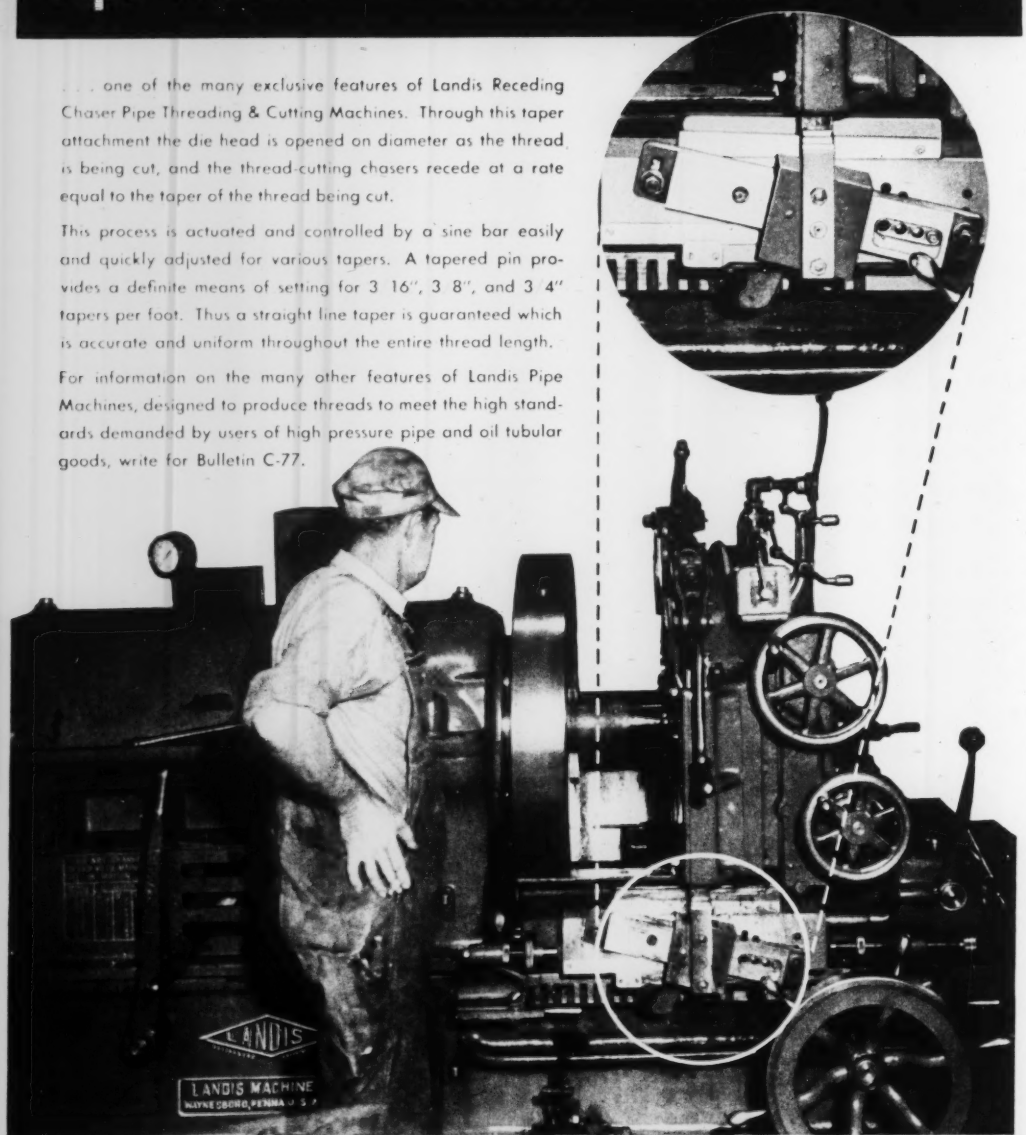
BETHLEHEM ALLOY STEELS

Receding Mechanism Guarantees Tapered Pipe Threads To Closest Tolerances . . .

. . . one of the many exclusive features of Landis Receding Chaser Pipe Threading & Cutting Machines. Through this taper attachment the die head is opened on diameter as the thread is being cut, and the thread-cutting chasers recede at a rate equal to the taper of the thread being cut.

This process is actuated and controlled by a sine bar easily and quickly adjusted for various tapers. A tapered pin provides a definite means of setting for 3 16", 3 8", and 3 4" tapers per foot. Thus a straight line taper is guaranteed which is accurate and uniform throughout the entire thread length.

For information on the many other features of Landis Pipe Machines, designed to produce threads to meet the high standards demanded by users of high pressure pipe and oil tubular goods, write for Bulletin C-77.

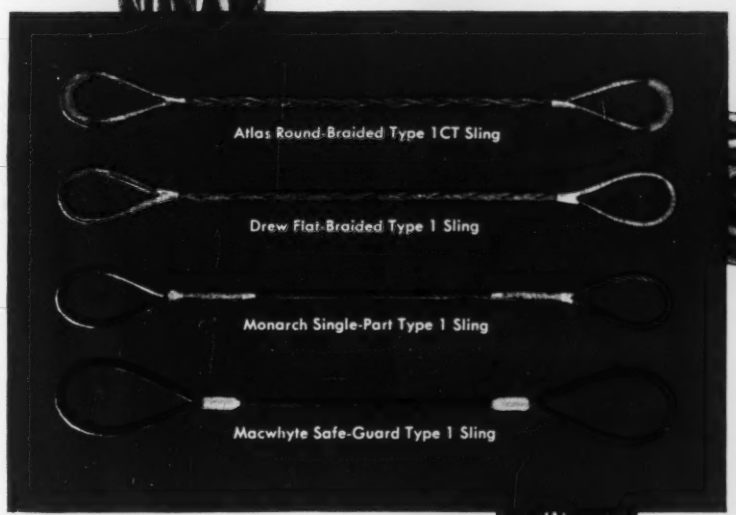


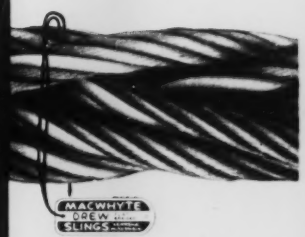
LANDIS *Machine* COMPANY · WAYNESBORO PENNSYLVANIA

See these Macwhyte Slings

and many more

at the Safety Congress Booth No. 78


Atlas Round-Braided Type 1CT Sling
Drew Flat-Braided Type 1 Sling
Monarch Single-Part Type 1 Sling
Macwhyte Safe-Guard Type 1 Sling



Macwhyte Slings

Here are four of the hundreds of slings pictured and listed in the newest Macwhyte Sling Catalog. All these slings are made to order in any size with fittings needed for your job. All three types of body are available: round-braided, flat-braided, single-part. Macwhyte has worked with hundreds of sling users toward more efficient materials handling. Our engineers are ready to study your sling needs and make recommendations.

For cranes and hoists specify PREformed Monarch Whyte Strand Crane Rope made by Macwhyte.

MACWHYTE COMPANY

KENOSHA, WIS.

Manufacturers of Internally Lubricated PREformed Wire Rope, Braided Wire Rope Slings, Aircraft Cable, Safe-Lock Assemblies, Monel Metal and Stainless Steel Wire Rope.

Mill depots: New York • Pittsburgh Chicago • St. Paul • Fort Worth • Portland • Seattle • San Francisco • Los Angeles • Distributors throughout U.S.A.

New Macwhyte Sling Catalog. Send today for complete sling catalog containing detailed information about slings for every need.

10148

Member National Safety Council

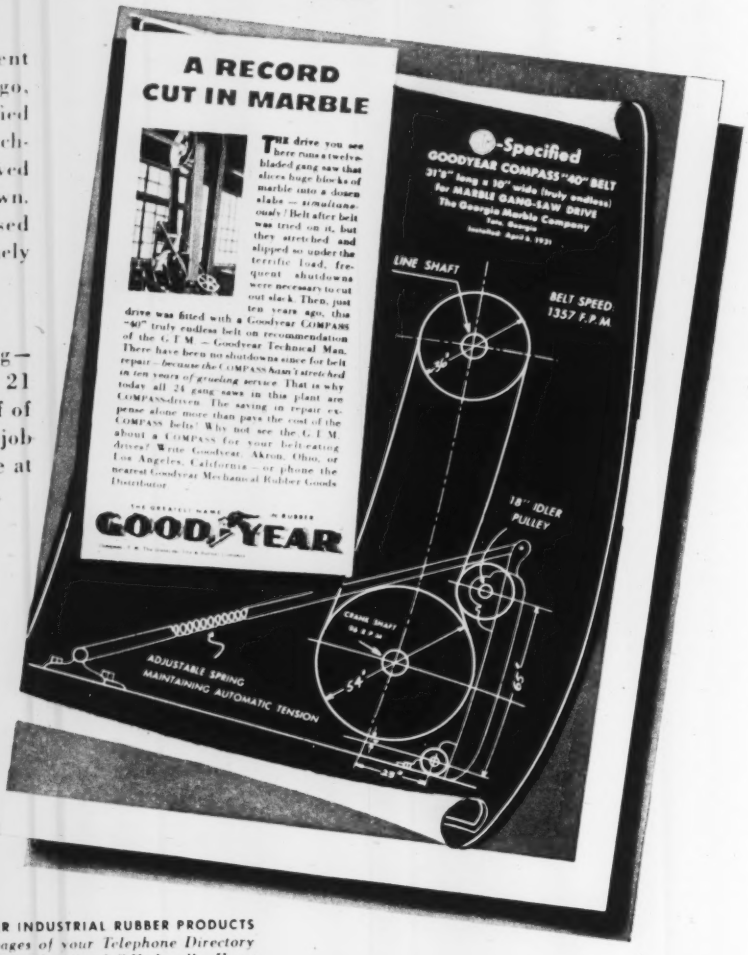
Looking For Long Belt Life?

THIS STORY SHOULD SHOW YOU THE ANSWER!

WHEN this advertisement appeared 11 years ago, the COMPASS 40 Belt specified by the G.T.M.—Goodyear Technical Man—had already served 10 years without a shut-down. Earlier belts had all caused trouble due to the extremely heavy drive.

TODAY

—this belt is still running—for a total life so far of 21 years and 7 months—proof of Goodyear's design-for-the-job that means longest service at lowest cost in the long run.


A RECORD CUT IN MARBLE
THE drive you see here runs a twelve-bladed gang saw that slices huge blocks of marble into a dozen slabs — simultaneously! Belt after belt was tried on it, but they stretched and slipped so under the terrific load, frequent shutdowns were necessary to cut out slack. Then, just ten years ago, this drive was fitted with a Goodyear COMPASS "40" truly endless belt on recommendation of the G.T.M. — Goodyear Technical Man. There have been no shutdowns since for belt repair—because the COMPASS hasn't stretched in ten years of grueling service. That is why today all 24 gang saws in this plant are COMPASS-driven. The saving in repair expense alone more than pays the cost of the COMPASS belts! Why not see the G.T.M. about a COMPASS for your belt-eating drives? Write Goodyear, Akron, Ohio, or Los Angeles, California — or phone the nearest Goodyear Mechanical Rubber Goods Distributor.
GOODYEAR
G-Specified
GOODYEAR COMPASS "40" BELT
31'8" long x 10" wide (truly endless)
for MARBLE GANG-SAW DRIVE
The Georgia Marble Company
Tate, Georgia
Installed: April 6, 1931
LINE SHAFT
BELT SPEED 1357 F.P.M.
36"
18" IDLER PULLEY
CRANK SHAFT
ADJUSTABLE SPRING MAINTAINING AUTOMATIC TENSION
54"
65"
29°

LOOK FOR YOUR GOODYEAR INDUSTRIAL RUBBER PRODUCTS DISTRIBUTOR *in the yellow pages of your Telephone Directory under "Rubber Products" or "Rubber Goods." He handles Hose, Flat Belts, V-Belts, Molded Goods, Packing, Tank Lining, Rubber-Covered Rolls built to the world's highest standard of quality.*

GOODYEAR

THE GREATEST NAME IN RUBBER

We think you'll like "THE GREATEST STORY EVER TOLD"—Every Sunday—ABC Network

Compass—T. M. The Goodyear Tire & Rubber Company, Akron, Ohio

This Week in Metalworking

STEEL

Vol. 131 No. 18 Nov. 3, 1952

✓NEWS ✓PRODUCTION-ENGINEERING ✓MARKETS

✓Metalworking Outlook 55

As the Editor Views the News 59
With election but a day away, Editor-in-Chief E. L. Shaner views and reviews the national scene

Windows of Washington 70

Mirrors of Motordom 77
Detroit Editor H. C. Tuttle reports on the new and interesting happenings in the nations' motor capital

The Business Trend 81

Men of Industry 85

✓Production-Engineering News at a Glance 91

Ultrasonic Cleaning Pays Off for Small Parts 92
High frequency sound waves operate in liquid and remove oil, chips, dirt and lapping compounds

Conveyors Boost Machine Tool Production 94
It's contrary to an old theory about machine tool production but it's set up and working well

Bigger Tool Steel Bars . . . the inside story 96
With better control over carbide concentration, they're now making high speed steel bars—large size

High Temperature Metallurgy: Jetomic Age Demands It 98
A peek at the problems of the metallurgist shows the increasing demand for temperature resisting metals

Progress in Steelmaking 106
Electric Brains Expand Steel's Muscle—Automatic systems for mill drives boost tonnage produced

New Products and Equipment 151

✓The Market Outlook 169
Metal Prices and Composites start on Page 170

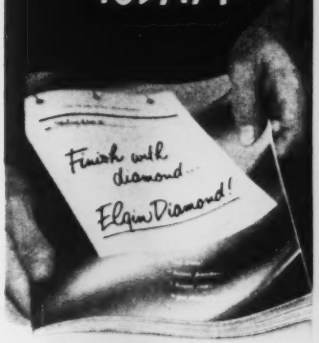
The Metal Market 181

Behind the Scenes	6	Obituaries	88
Letters to the Editors	10	Calendar of Meetings	146
Subcontract Summary	68	Helpful Literature	165
Checklist on Controls	68	Here, There in Metalworking	191

Editorial, Business Staffs—16. Advertising Index—197. Editorial Index available semiannually. STEEL also is indexed by Engineering Index Inc., 29 West 39th St., New York 18.

Published every Monday by the Penton Publishing Company, Penton Building, Cleveland 13, Ohio. Subscription in the United States and possessions, Canada, Mexico, Cuba, Central and South America, one year $10, two years $15; all other countries, one year $20. Single copies (current issues) 50 cents. Metalworking Yearbook issue $2.00. Entered as second class matter at the postoffice in Cleveland, under the Act of March 3, 1879. Copyright 1952 by Penton Publishing Co.

SEND FOR THIS FREE BOOKLET TODAY!



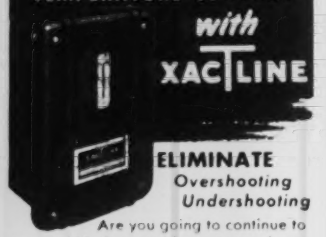
Here's a way to save time and improve finish quality

See why diamond is the fastest cutting of all abrasives . . . and why Elgin Diamond is the fastest cutting of all diamond abrasives. Illustrations and specific data on plastic mold polishing, drawing die finishing, tool and gage lapping and mass production polishing of component parts will help you solve your own finishing problems. Write for your copy now . . . ask for a free demonstration in your own shop to prove how you will save when you . . .

Finish with Diamond... ELGIN Diamond!

ABRASIVES DIVISION, DEPT. C
ELGIN NATIONAL WATCH CO.
ELGIN, ILLINOIS

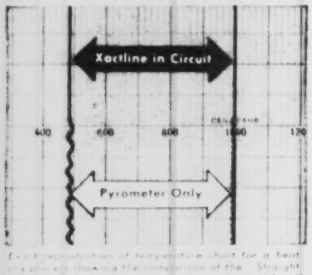
Automatic "STRAIGHT-LINE" TEMPERATURE CONTROL with XACTLINE



ELIMINATE
Overshooting
Undershooting

Are you going to continue to put up with that troublesome overshooting and undershooting inherent in your conventional pyrometer control—especially when it is so easy to eliminate that saw tooth effect?

Put XACTLINE in the control circuit. XACTLINE anticipates the temperature changes—before they occur. And too, it nullifies the varying amounts of thermal lag, residual heat, and mechanical lag—producing a short on off cycle resulting in "Straight Line" temperature control. This performance is possible because there is no dependence upon mechanical parts—XACTLINE operates electrically.



Exact reproduction of temperature chart for a heat cycle process showing the comparison of the "Straight Line" temperature control produced by XACTLINE and the saw tooth curve obtained with only conventional control.

XACTLINE is applicable to any indicating or recording pyrometer control of the millivoltmeter or potentiometer type. It should be used wherever close temperature control is required—any type of electrically heated oven, furnace, kiln, injection molding machine, and fuel fired furnaces equipped with motor operated or solenoid valves.

XACTLINE is a complete unit. No adjustment or coordination with the control instrument is required regardless of the size of the furnace, length of the heating cycle, or size of the load. Installation is very simple—can be either flush or surface mounted.

PRICE $89.50 F.O.B. CHICAGO
Nothing else to Buy

GORDON SERVICE

CLAUD S. GORDON CO.
Manufacturers & Distributors
Thermocouple Supplies • Industrial Furnaces & Ovens
Pyrometers & Controls • Metallurgical Testing Machines
Dept. 14 • 3000 South Wallace St., Chicago 16, Ill.
Dept. 14 • 2035 Hamilton Ave., Cleveland 14, Ohio

Behind the Scenes . . .

Full Measure

Somebody gave a friend of ours a set of demitasse cups a while ago. His wife was tickled with them but everybody told him how impractical they were.

He's come to like them as well as his wife—maybe even more. He's found they hold at least twice as much as a jigger.

Ballot Casting

Since this issue of STEEL is due to drop out of the mail box on Nov. 3, we've decided to publish a poem on voting. It was written especially

for us by Pat Dwyer Jr., poet laureate of our page. If you don't get a chance to read it till after the 4th, just hold it for the next election coming up.

May we rise to hint and note
That the time has come to vote!
Grab your rubbers and your coat,
Wrap your tie about your throat;
Scramble down by bus or boat,
Ride a horse, or jeep, or goat;
If you have to, fly or float,
'Cause there's NO place too remote
For the man who wants to vote.
If on Democrats you dote,
Let your X's so denote,
If that party makes you bloat,
And on G.O.P. you gloat,
Then the G.O.P. promote!
In a government by rote,
Right to vote is table d'hote,
And without this antidote,
Freedom's worthless as a groat.
Whomsoever you denote,
When the final X is wrote,
Will be mighty glad to note
That at anarchy you smote
SO GET OUT THERE, CHUMS,
AND VOTE!

Clarification

When Art Zimmerman was working on the plant protection story for several issues ago, he called some private detective agencies. He'd start out by saying, "This is Art Zimmerman, STEEL magazine." Then before they had a chance to confuse the issue, he'd hastily explain how to spell STEEL and describe the nature of his business.

It was simply a case of stopping an over-anxious private eye before he had a chance to deduce.

Secret

Arthur Godfrey says a California man celebrated his 107th birthday a couple of weeks ago. A reporter (not from STEEL) who was interviewing him asked what the rest of us could do to live that long.

The answer: "Just keep breathin', son, just keep breathin'.

Who'd Walk?

Another tribulation of district editors showed up a while ago when we got the following teletype message from Erle Ross, in the Chicago office.

"Market reports necessarily light because elevator strike has closed many offices and made contacts impossible."

Ah, civilization!

Puzzle Corner

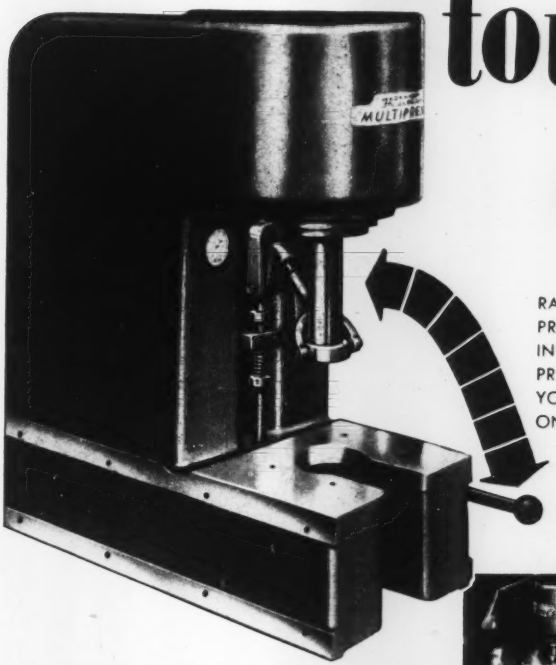
The answers to the puzzle in the Oct. 20th issue are 1 and 2. As some of the mathematicians have pointed out, zero would work too. First across the finish line with that one were: George W. Frederick, Republic Steel Corp., G. A. Meyer Jr., Malleable Founders Society, L. D. Rice, Timken Roller Bearing Co., M. S. Bailey, Machine Products Corp., Harry Rupp, Service Iron & Steel Co., Jack R. Allen and Alfred W. Carey Jr., National Supply Co. and Henry Davis, Wickwire Spencer Steel Div.

Here's one that's a little out-of-season, but you can try it any way. A swimming pool which holds 1000 cubic yards of water can be filled by either of two inlet pipes in three and four hours respectively; and can be emptied by either of two outlet pipes in five and six hours respectively. How long does it take to fill the tank if both inlet pipes and both outlet pipes are open?

Shrdlu

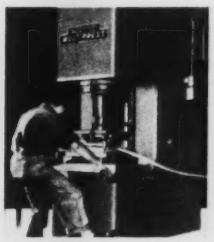
(Metalworking Outlook—Page 55)

new MULTIPRESS® "touch control"



RAM MOVEMENT AND PRESSURE RESPOND INSTANTLY—IN DIRECT PROPORTION TO THE WAY YOU MOVE OR PRESS DOWN ON THIS HAND LEVER

PERFECT RAM CONTROL IN THE PALM OF YOUR HAND



Multipress is built in eight frame sizes and in one ton to 50 ton capacities—all available with Touch Control.

Now you can have all the *operating* advantages of Multipress plus quick, sure, direct-action "Touch Control". The slightest movement of this "slave-type" control is converted instantly and directly into ram movement . . . the ram starts, stops, reverses, speeds up, slows down, or exerts pressure in *exact, split-second relation* to every move of the hand lever. Every added ounce of pressure on the lever is instantly *multiplied* into added ram effort—in an exact ratio. It is as though the operator's hand and arm move the ram itself with the power of a skilled giant. Rapid-fire "jiggling" of the lever brings equivalent "vibratory" pressure applications on the work.

Pressures are quickly and accurately shown on the dial gauge. The operator can build up pressures quickly or slowly, to any predetermined need. And because ram movement and pressure are so accurately related to every movement of the hand lever, he quickly gets the "feel" of any repeated operation.

Stroke length is fully adjustable at both its upper and lower limits, and maximum tonnage can also be preset to any pressure within the limits of the press.

With "Touch Control" the fast, smooth oil-hydraulic accuracy of Multipress is made even more closely adaptable to all types of production jobs where complete control of the ram is needed, as in straightening operations.
Write for full details today.

The DENISON Engineering Co.
1163 Dublin Road **Columbus 16, Ohio**

DENISON HydrOILics

POWERED FOR PRODUCTION

WARNER & SWASEY SADDLE TYPE TURRET LATHES deliver tremendous power for the toughest jobs. The one-piece bed, with integrally cast head and VEE-WAYS, carries massive solid weight at the right places. And with diagonal cross-ribbed reinforcing it insures the rigidity that holds accuracy.

You can really hog off tough metal *fast* with any Warner & Swasey Heavy Duty Machine. You can give the job everything that carbide tooling can take.

And along with power, these machines have an industry-wide reputation for *holding* their precision accuracy. Warner & Swasey's are built to provide the right combination of power, speed and accuracy for the most rugged, heavy duty service throughout many years of trouble-free service.

YOU CAN MACHINE IT BETTER, FASTER, FOR LESS WITH WARNER & SWASEY TURRET LATHES, AUTOMATICS, AND TAPPING MACHINES

SPRING WIRE

For uniform quality, we're sure this spring wire is the best we've ever made

ROEBLING is about the largest specialty wire manufacturer in America. And with progressively improved facilities and more positive controls we are constantly turning out wires with a higher uniformity of gauge, finish and mechanical properties.

Among these products that save preparation time and boost production for users are mechanical spring wires including hard drawn, soft, annealed or oil-tempered M.B., H.B. and Extra H.B.; music wire; upholsterers' spring wire and valve spring wire...all in a full range of physical properties and finishes.

Reduce your machine shut-downs and step up overall production with the Roebling specialty wire that will meet your most exacting requirements. John A. Roebling's Sons Company, Trenton 2, N. J.

ROEBLING

ATLANTA, 934 AVON AVE. • BOSTON, 31 SLEEPER ST. • CHICAGO, 5525 W. ROOSEVELT RD. • CINCINNATI, 3253 FREDONIA AVE. • CLEVELAND, 13228 LAKEWOOD HEIGHTS BLVD. • DENVER, 4801 JACKSON ST. • DETROIT, 915 FISHER BLDG. • HOUSTON, 6216 NAVIGATION BLVD. • LOS ANGELES, 5340 E. HARBOR ST. • NEW YORK, 19 RECTOR ST. • ODESSA, TEXAS, 1920 E. 2ND ST. • PHILADELPHIA, 230 VINE ST. • SAN FRANCISCO, 1740 17TH ST. • SEATTLE, 900 1ST AVE. S. • TULSA, 331 N. CHEYENNE ST. • EXPORT SALES OFFICE, TRENTON 2, N. J.

NEW

PACKAGED carbon dioxide FIRE EXTINGUISHING SYSTEM

inexpensive . . . simple . . . sure!

Do you want maximum fire-fighting power at minimum cost? Then you want the new *Kidde* Standard Pak. It's an inexpensive ready-made system you can build in for protection against tough fires in normal flammable liquid hazards.

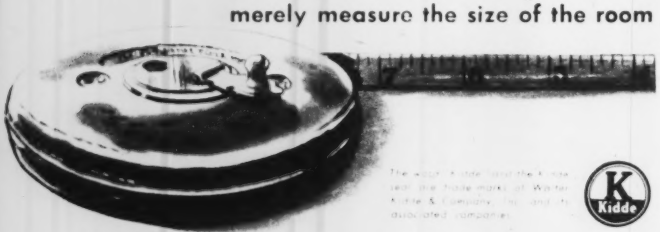
Anyone who can cut pipe can set up this pre-engineered fire extinguishing "package." Choose from six sizes for volumes up to 6,000 cubic feet.

Every kit contains *Kidde* rate-of-temperature-rise heat detectors, *Kidde* Multijet nozzles, and automatic discharge heads. Pipe and fittings are optional, as are pressure trips and switches, remote controls, sirens, gongs.

pre-engineered

any pipefitter can install it

merely measure the size of the room



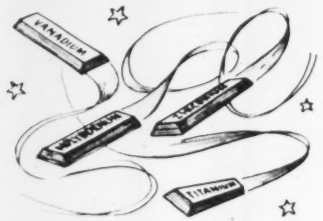
Send today for further details on The New *Kidde* Packaged Fire Extinguishing System.

Kidde

Walter Kidde & Company, Inc.
1160 Main Street, Belleville 9, N. J.
Walter Kidde & Company of Canada, Ltd., Montreal, P. Q.

LETTERS TO THE EDITORS

Focus on Metals in Jet Age



In your Oct. 13 issue of STEEL, much interest has been shown by men of our organization in the article "Metals in the Jetomic Age" (p. 148).

This is to inquire whether we can get 20 copies for distribution among our engineering and production staff.

Harvey O. Tenner
American Phenolic Corp.
Chicago

. . . please send 3 tear sheets of "Metals in the Jetomic Age."

Bruce Multhaup
Thompson Products Co.
Cleveland

• *These and many other requests for reprints are being filled.—ED.*

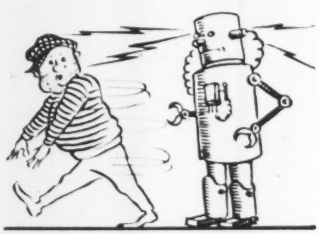
Keeping Up with the Market

What would the national ingot production be in your estimated $120 billion metalworking market by 1960 (Jan. 1, 1951, p. 85)?

L. A. Douglas
U. S. Steel Supply Co.
Chicago

• *In making our projection we made our approach from the market side. That is, we figured how big the market would be and assumed that industry would provide adequate capacity to fulfill the market. The industry people to whom we talked in making this study generally agreed that 120 million tons of ingot capacity, which we will achieve by 1954, should be adequate to support a metalworking output of $120 billion, speaking in terms of 1951 dollars.—ED.*

Plaudit on Plant Protection



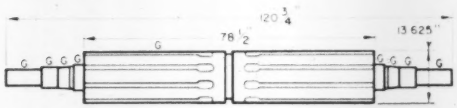
I experienced a great deal of pleasure in reading your article "Plant Protection," (Oct. 20, p. 72).

On behalf of our company, and pro-

Continued on following page

WORK DATA

Machine: Landis 24" x 144" Type FR Roll Grinder
Stock Removal: .025" on main diameter
Tolerance: Body Diameter, .002"
Taper Gauge to Face of Cylinder, ± .001"
Time: 6 hours floor-to-floor



Landis Roll Grinder Saves Time Grinding Slotted Cylinder

At Wood Newspaper Machinery Corporation, this new Landis Roll Grinder has replaced an older machine. The intermittent cut on the body and precision limits on the taper makes this an unusual job. The work piece weighs 3,500 lbs.

They are doing two extra grinding operations on this machine and still save one hour on floor-to-floor time.

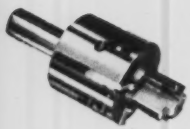
Production and quality improvements like these can be made on your grinding operations with modern Landis Grinders. Write for Catalog F-48. Landis Tool Company, Waynesboro, Penna.

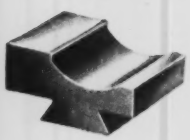
146A

LANDIS

precision grinders

with *Gorham*-ENGINEERED
SPECIAL CUTTING TOOLS





Next time you're up against a tough tooling problem, call in the man who can give you *the right answers fast* . . . your nearby Gorham Field Engineer! He's an expert in special cutting tools . . . and he's ready to provide a complete engineering service to determine your exact tooling requirements. He starts with your product, sketch or idea. He surveys your production operations and available equipment. He considers work material properties and desired finishes and tolerances. He plots proper machine feed, speed and method of tool driving. Then he develops practical design and engineering specifications for special cutting tools, metallurgically "tailor-made" for your application.

His recommendations are backed by Gorham's unmatched facilities, which include three fully-equipped modern plants, a large Engineering and Metallurgical staff, and a force of field application engineers in principal industrial centers, coast-to-coast. All are dedicated to furnishing prompt and profitable solutions to your special tooling problems. Gorham-engineered "specials" are turning problems into profits in thousands of plants every day . . . why not let them do the same for *you*? If you haven't met your nearby Gorham Field Engineer, write for his name, or send details of your problem direct for recommendations.

Gorham TOOL COMPANY

"EVERYTHING IN STANDARD AND SPECIAL CUTTING TOOLS"

14401 WOODROW WILSON • DETROIT 3, MICHIGAN

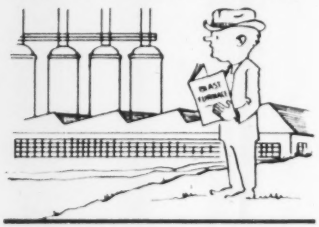
LETTERS

Concluded from preceding page

tection as a whole, I wish to express our sincere gratefulness to you and your publishing company for mentioning the many good things available in modern protection engineering.

C. L. Chafee
commercial superintendent
American District Telegraph Co.
Cleveland

Blast Furnace Article Booming



We understand from p. 82 of the June 23 issue of STEEL that you are publishing reprints of the complete series comprising the 19 installments "Blast Furnace Practice" for $1.00 per copy.

Please send us 3 copies of this reprint as soon as possible.

Ameriux Steel Products Corp.
New York

. . . send us one reprint of the series of 19 reports.

E. E. Sabol
Air Reduction Co.
New York

. . . please consider this our order for a reprint of "Blast Furnace Practices."

G. Ford
National Lead Co.
titanium division
South Amboy, N. J.

My company has been a subscriber to STEEL for a great many years and I hope that this will continue so that I may have the advantage of reading for a long time hereafter.

I am very anxious to have a copy of the book titled "Blast Furnace Practice."

Arthur G. McKee
Arthur G. McKee & Co.
Cleveland

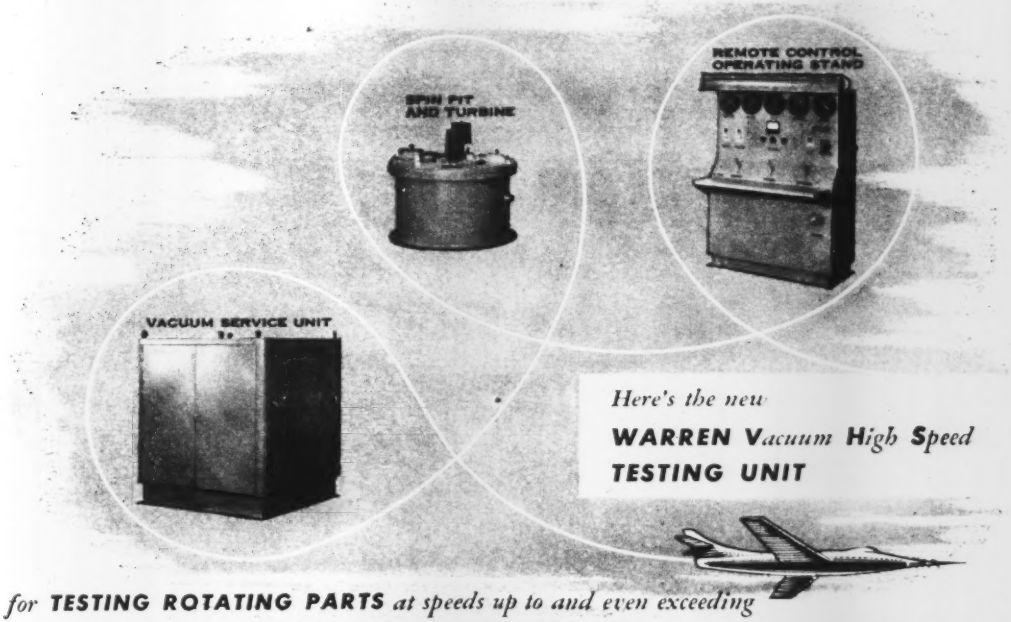
• *Reprints of the series "Blast Furnace Practice" are still available at $1.00 each.—ED.*

The International Department

In reference to the picture on p. 92 of your July 14, 1952 issue, showing the "Business End of the Sendzimer Mill," we would like to know who makes these mills and have they been supplied to anyone on a production basis or are they still working on an experimental basis.

Phiroz Kutar
general manager
Tata Iron & Steel Co. Ltd.
Jamshedpur, India

• *The Sendzimer Mill, about which you inquired, is a development of Armzen Co., Waterbury, Conn., and is built by Waterbury-Farrel Foundry & Machine Co., Waterbury. The mills are definitely being supplied on a production basis. —ED.*



Here's the new

WARREN *Vacuum High Speed* TESTING UNIT

for **TESTING ROTATING PARTS** *at speeds up to and even exceeding*

100,000 rpm!

AFTER DYNAMIC BALANCING to observe any possible vibration of the rotating parts of gas turbines in military aircraft, it is imperative that they be tested at **abnormal speeds** — speeds beyond those that would ever be encountered in actual use.

PARTS MUST BE TESTED IN A VACUUM Vacuum SpinTesting © is required, because it prevents the build-up of temperatures in the part — due to air friction. In the vacuum, the test can be conducted with a relatively low horsepower driving source, and on a much quicker operating cycle . . . thus making possible the testing of turbine rotors, axial flow compressors and similar parts as they come off the assembly line.

Only in this way, by WARREN VACUUM SpinTesting ©, can you ever be **sure** of the absence of vibration in these rotating parts that are to be used under extremely critical conditions.

With Warren Vacuum High Speed Testing equipment, tests of jet engine parts and accessories are conducted in accordance with procedures established by the Air Force or the Navy Bureau of Aeronautics.

Pioneering in this field, 27 large-scale installations of Warren Vacuum High Speed Testing Units have already been made in various manufacturing plants and Air Force bases throughout the U. S.

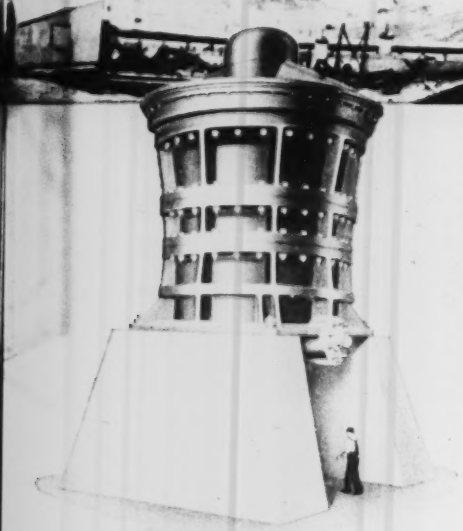
Write for literature **which describes this equipment, now available in three sizes:**

VHS-1	**for parts up to 55" dia. weighing up to 2500 pounds, to SpinTest © up to 25,000 rpm.**
VHS-2	**for parts up to 40" dia. weighing up to 200 pounds, to SpinTest © up to 60,000 rpm.**
VHS-3	**for parts up to 15" dia. weighing up to 15 pounds, to SpinTest © up to 100,000 rpm.**

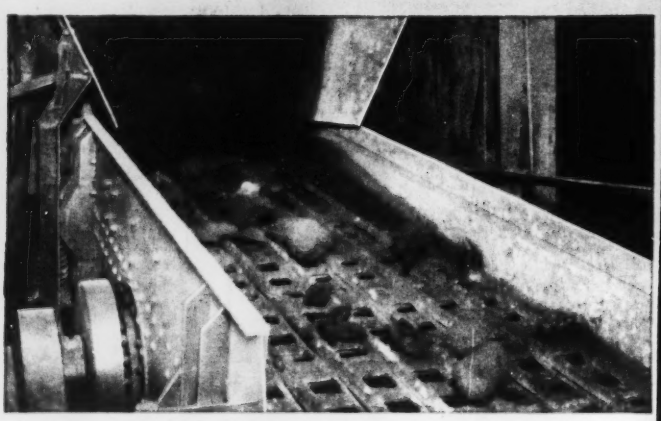
WARREN BROTHERS MANUFACTURING DIVISION
WARREN BROTHERS ROADS COMPANY
32 POTTER STREET • CAMBRIDGE 42 • MASSACHUSETTS

- **DESIGNING**
- **ENGINEERING**
- **MANUFACTURING**

Nearing



WORLD'S LARGEST CRUSHERS are two 3500-tph, 60-109 *Superior* gyratories being built for Mesabi's first commercial taconite plant. Ultimate plant output will be 10 million tons.



FINES ARE SCALPED from r.o.m. ore on sturdy 1000-tph vibrating screens like this one in Minnesota. A-C builds *six* separate types of vibrating screens for beneficiation.

EQUIPMENT FOR IRON ORE BENEFICIATION: Gyratory and jaw crushers . . . Vibrating screens . . . All types of washers . . . Concentrating jigs . . . Rod, ball, and *Ballpeb* mills . . . Centrifugal pumps . . . Rotary kilns and coolers . . . *Texrope* V-belt drives . . . All types and sizes of electric motors and generators . . . Starters . . . Transformers and voltage regulators . . . Complete power generation, distribution, control equipment.

the Bottom!

As Mesabi Ores Lean Out, Allis-Chalmers Aids in Beneficiation

DIRECT SHIPPING ORES are fading fast up on the once fabulous Mesabi range. But despite foreign ore discoveries, by 1955 a quarter of blast furnace feed must be beneficiated domestic ore.

Allis-Chalmers — manufacturer of equipment for the steel industry from the mine to the mill — is helping lead the way to more economical beneficiation of lean ores.

Does low ore content require you to triple material handled? Allis-Chalmers will build you bigger, more efficient equipment! At far left below is the world's largest crusher, being built by A-C for a Mesabi taconite plant.

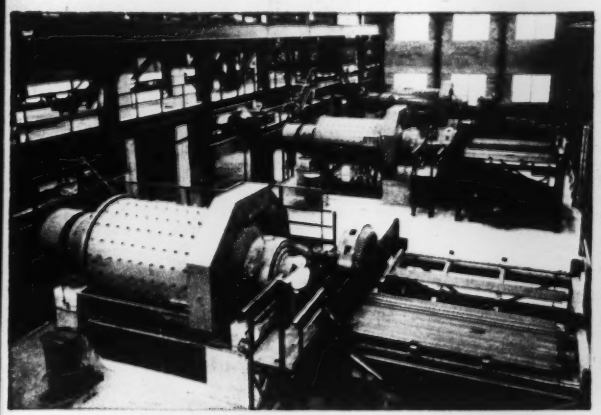
Has proper yet economical pelletizing got you stumped? Allis-Chalmers has just put into operation a pilot Pelletizing and Heat Hardening plant built exclusively for researching new pelletizing methods.

Do you have a beneficiation "shortcut" in mind? Don't let lack of equipment postpone your testing of new processes. The Allis-Chalmers Processing Research Laboratory stands ready to accurately and exhaustively test any processing method on a confidential basis.

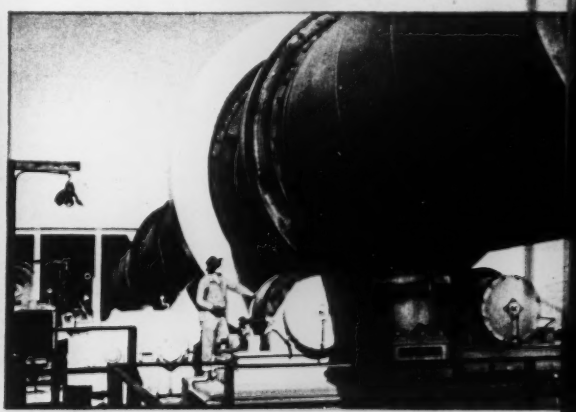
For over half a century Allis-Chalmers equipment has been processing ores for America's steel industry. Some of the cost-cutting, tonnage-increasing ore beneficiation equipment in the broad A-C line is seen on these pages.

Allis-Chalmers offers you *one-manufacturer responsibility* for process, drive and control equipment all along your flow sheet. For literature or detailed information on products and services, call your nearest A-C office or write to Allis-Chalmers, Milwaukee 1, Wisconsin. A-3808

Superior, Ballpeb and Texrope are Allis-Chalmers trademarks.



ORE IS GROUND in three rod and ball mills ahead of magnetic separation at this beneficiation plant. A-C builds *all* types of grinding mills for ore beneficiation processes.



IRON ORE IS AGGLOMERATED to make good blast furnace and open hearth feed in Allis-Chalmers rotary kilns in connection with iron mines and beneficiation plants.

ALLIS-CHALMERS

Power, Electrical, Processing Equipment for Iron and Steel

LEBANON CIRCLE L

Castings

in Stainless and Special Alloys . . .

require Control in Core-setting

There is just no "good enough" way to set cores, for close tolerances must be held if costly, time-consuming, corrective work is to be eliminated—and time is vital today. Core-setting and its companion step, core-making, call for precise skill and infinite care, yet these are but two of many production procedures followed with such care by all Lebanon craftsmen to produce CIRCLE L castings of *controlled* high quality.

LEBANON STEEL FOUNDRY
Lebanon, Pennsylvania
"In the Lebanon Valley"

CIRCLE L **LEBANON** *Steel and Alloy Steel*

Castings

STEEL

The Weekly Magazine of Metalworking

Editor-in-Chief, EARL L. SHANER — *Editor*, IRWIN H. SUCH
Managing Editor, WALTER J. CAMPBELL
Assistant Managing Editors, VANCE BELL, JOHN S. MORGAN

News and Markets

WM. M. ROONEY	*Market Editor*
FRANK R. BRIGGS	*Associate Editor*
ARTHUR W. ZIMMERMAN	*Assistant Editor*
JOHN KELSEY	*Assistant Editor*
ROBERT O. JAYNES	*Assistant Editor*
FLOYD G. LAWRENCE	*Assistant Editor*
ROBERT M. LOVE	*Assistant Editor*
MARY T. BORGERHOFF	*Assistant Editor*
LIZABETH J. KEATING	*Editorial Asst.*

Engineering and Production

EDWIN L. KARPICK	*Associate Editor*
JAY DEEULIS	*Associate Editor*
ALLEN G. GRAY	*Technical Editor*
J. D. KNOX	*Steel Plant Editor*
WM. R. WOLFE	*Assistant Editor*
ROBERT F. HUBER	*Assistant Editor*
THOMAS F. HRUBY	*Assistant Editor*
DOLORES K. MAILLE	*Assistant Editor*
NANCY SHAFFER	*Editorial Asst.*

Resident Editors

New York 17 — 60 East 42nd St.
B. K. PRICE, L. E. BROWNE, S. W. BAKER
Murray Hill 2-2581

Chicago 11 — 520 North Michigan Ave.
E. F. ROSS
Whitehall 4-1234

Pittsburgh 19 — 2837 Koppers Bldg.
ROBERT E. HALL
Atlantic 1-3211

Detroit 2 — 6560 Cass Ave.
HOWARD C. TUTTLE
Trinity 5-3024

Washington 4 — 1123 National Press Bldg.
E. C. KREUTZBERG
Executive 6849

London, 2 Caxton St., Westminster S.W. 1
VINCENT DELPORT
European Editor

Editorial Correspondents

Birmingham — R. W. KINCEY
Birmingham 3-1121

Buffalo — L. G. FELDMANN
Cleveland 5353

St. Louis — MAC L. HUTCHENS
Republic 7752

Youngstown — GEORGE R. REISS
7-1471

Los Angeles — NORMAN LYNN
Hudson 2-4376

San Francisco — EDWIN HAVERTY
Yukon 6-5151

Seattle — R. C. HILL
Melrose 1895

Dallas — C. K. CATES
Riverside 4355

Toronto — F. S. TOBIN
Empire 4-9655

Birmingham, Eng. — J. A. HORTON

Paris, France — LEON JAUDOIN-PROM

Liege, Belgium — M. JACQUES FOULON

Dusseldorf, Germany — DR. HERBERT GROSS

BUSINESS STAFF

Business Manager, J. W. ZUBER

Advertising Manager	C. H. BAILEY	*Circulation Manager*	G. R. EBERSOLE
Production Manager	A. V. ANDERSON	*Market Statistics*	G. J. AUNER
Promotion Research Mgr.	S. F. MARINO	*Mail & List Service*	BETTY HINTON
Classified Advertising Mgr.	DORIS ROBBINS	*Reprints*	C. B. NILES

Advertising Representatives

New York 17 — 60 East 42nd St.
E. W. KREUTZBERG, K. A. ZOLLNER
Murray Hill 2-2581

Farmington, Conn. — 12 Farmstead Lane
CALVIN FISHER, JR.
Farmington 7-1756

Pittsburgh 19 — 2837 Koppers Bldg.
S. H. JASPER, J. C. SULLIVAN
Atlantic 1-3211

Cleveland 13 — Penton Building
D. C. KIEFER, H. G. ROWLAND, E. L. FRANKE
Main 1-8260

Detroit 28 — 8119 Beaverland
C. A. TALLINGER
Logan 2-3868

Chicago 11 — 520 North Michigan Ave.
L. C. PELOTT, W. L. POLAND, JOHN W. VAUGHAN
Whitehall 4-1234

Los Angeles 48 — 6262 Commodore Sloat Dr.
F. J. FULLER
Webster 1-6865

Griffin, Georgia — 331 South 12th St.
FRED J. ALLEN
Griffin 7854

Circulation Representatives

H. R. DUNNE, C. A. PRICE

CCA — NBP — MPA

Published Every Monday by
THE PENTON PUBLISHING CO., Penton Bldg., Cleveland 13, Ohio

President and Treasurer — G. O. HAYS
Chairman — E. L. SHANER
Vice Pres., Director of Advertising — R. C. JAENKE
Vice Pres. and Secretary — F. G. STEINEBACH
Asst. Secy. and Asst. Treas. — J. P. LIPKA

Also Publisher of FOUNDRY, MACHINE DESIGN, NEW EQUIPMENT DIGEST

Member of Controlled Circulation Audit, Inc., Magazine Publishers Association Inc., Society of Business Magazine Editors, and National Business Publications, Inc.

Production Pointers from GISHOLT

GISHOLT TIME-SAVING IDEAS

Presented as a service to machine shops, we hope some of these interesting ideas, culled from thousands of jobs, will suggest ways to help you cut time and costs in your own metal work.

COST-SAVING SETUP FOR MACHINING BOTH ENDS AT ONCE

Shows Value of Proper Tool Planning with Versatile Lathe

You can see real thinking has gone into this setup for machining tractor rear axle housings. As the result, this Simplimatic Automatic Lathe is simultaneously machining the two end flanges in a single, fast operation.

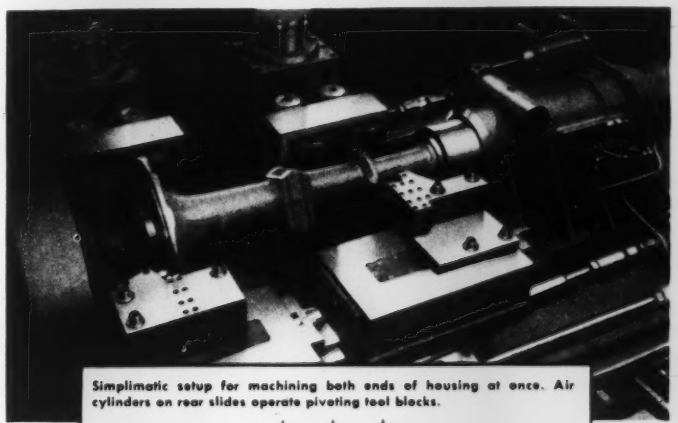
Work is divided between the four slides. All turning and some chamfering are done by the two front slides. The two rear slides take care of the straddle facing . . . doing it in an extremely clever way. Each of these rear slides consists of a pair of pivoted tool blocks which have a scissors-like action.

Tool Blocks have Two Sections

The two *right* rear tool blocks are tightly wedged together at the start of the cut. When straddle facing is completed they spring apart, providing tool relief for the withdrawal.

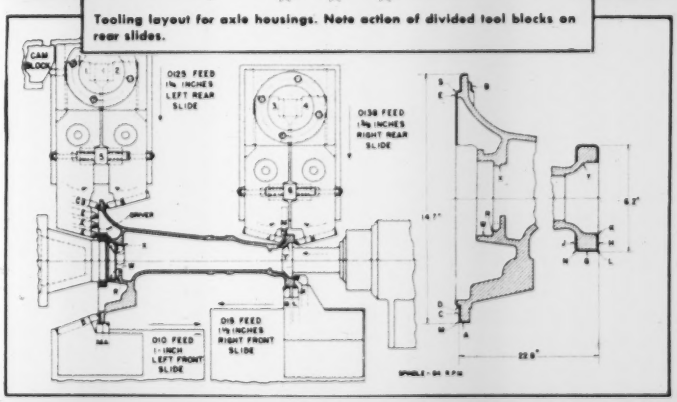
There's a different action to the two *left* rear tool blocks. Here, the tool blocks are partially wedged together as the slide feeds the tools into the work. As the slide continues to feed forward, the straddle facing tools are brought closer together. This splits the wide facing cut among three tools. At the completion of the cut, the tools spring apart for tool relief. Floor-to-floor time for the entire automatic operation is 1.33 minutes.

Pivoting tool blocks on this Simplimatic job provide the answer for machining both flanges in a single operation.



Simplimatic setup for machining both ends of housing at once. Air cylinders on rear slides operate pivoting tool blocks.

★ ★ ★



Tooling layout for axle housings. Note action of divided tool blocks on rear slides.

Other interesting jobs . . . handled on the Simplimatic Automatic Lathe, plus full information and specifications are yours in the all new Simplimatic catalog just off the press. Ask for your copy.

GISHOLT

TIME-SAVING IDEAS

FOR MORE PRODUCTION FROM

AUTOMATIC LATHE TURNS OUT PARTS IN PAIRS

Tooling Arranged for Handling Related Parts with One Setup

Here's a 1F Fastermatic Automatic Turret Lathe specializing in the production of a wide assortment of mating parts. The steel forgings are handled in lots of 200 pieces—100 male and 100 female parts.

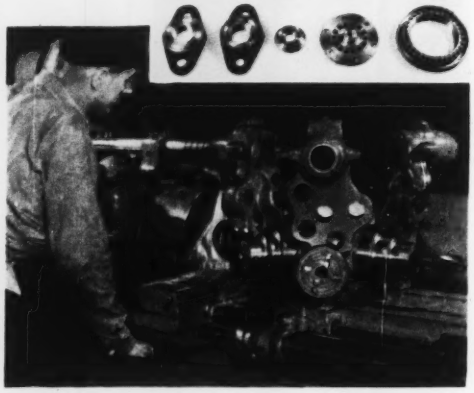
Simple tooling takes care of the simple operations involved. Just two faces of the hexagon turret are needed for each part . . . but the handling of alternate male and female parts keeps four turret stations busy.

The photo shows a male flange being formed. This is followed by a drilling operation. After that, the operator removes the male flange and chucks a female flange (using same chuck jaws). Passing the next turret face, work is then begun on this flange. From stations four and five the female flange is drilled and faced. Turret station six is then passed and the operation is complete . . . and a male flange is again handled.

The nice feature of this setup is that with one set of tools on the machine, you complete *two* mating parts. This way you're always sure the parts will match perfectly. Moreover, since alternate pieces are machined, there's no problem in keeping quantities even. Total time for a pair of these parts is an even 5 minutes.

Typical parts handled in pairs on the Fastermatic.

Small parts, even in small lots, are economically produced in pairs by the Fastermatic Automatic Lathe.



Male flange being formed. After next drilling operation, female flange is machined. Then male flange again.

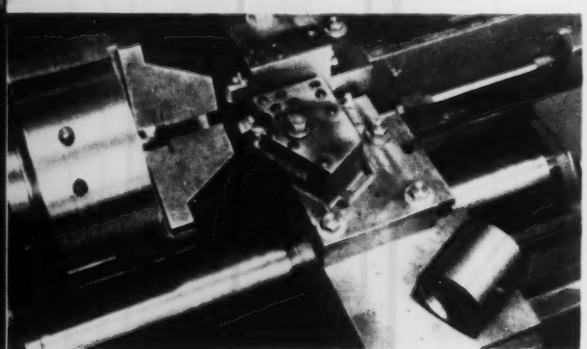
PISTONS BORED AND CENTERED IN 1ST OPERATION

No. 12 Hydraulic Automatic Lathe Combines Machining of Skirt and Centering of Dome

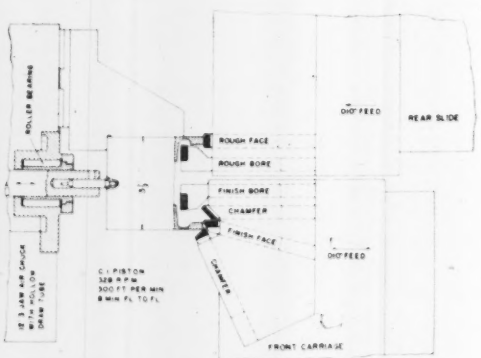
The main operations are on the skirt end of this cast iron tractor piston. The rear slide feeding longitudinally rough bores and faces the skirt. As this slide withdraws, the front carriage moves longitudinally to finish bore and chamfer the ID. It then swings in to finish face and chamfer the OD. It is then withdrawn from the position to provide tool relief.

After operations on the piston skirt, the No. 12 Hydraulic completes its job by centering the piston dome. This is handled by the back boring attachment in the spindle. Floor to floor time is .8 minute. Several sizes of pistons are handled by this No. 12 Hydraulic, all with fully automatic operation.

Combining boring of skirt and centering of dome saves time and provides complete concentricity for following machining operations.



Close up of Tooling for boring and facing skirt end of piston and centering dome end.



Cast iron tractor piston job on the No. 12 Hydraulic Automatic Lathe.

GISHOLT

LOOK AHEAD . . . KEEP AHEAD . . . WITH GISHOLT

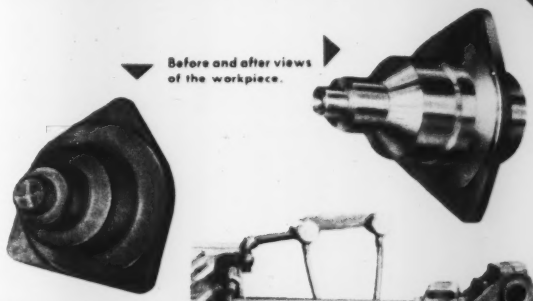
GISHOLT

TIME-SAVING IDEAS

EASY DOES IT...WITH A 6-SPEED CHANGE OF PACE

Saddle Type Turret Lathe Cuts Time Lag with Speed Selector

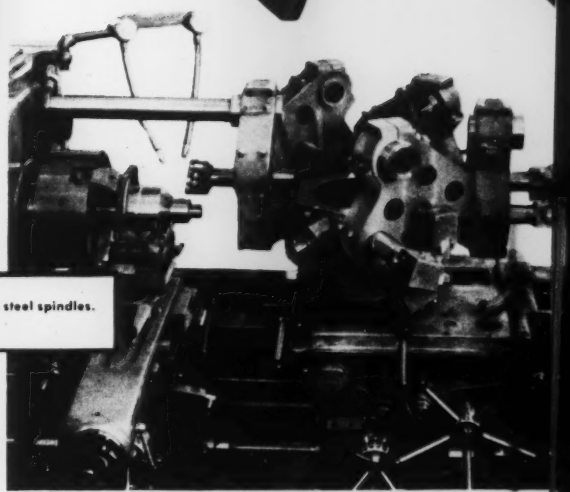
Before and after views of the workpiece.



While the operations needed to finish these spindles are all relatively simple, the job could be a trouble-maker on a less able machine than this 2L Saddle Type Turret Lathe.

Here's why: The part's a tough steel forging weighing in at 103 lbs. and finishing at 93 lbs. Not much stock removed, to be sure, but it takes carbide to do it. The workpiece is chucked on the previously turned short rear hub with a standard 3-jaw airchuck to speed up handling. Standard tools are used to finish all twelve outside diameters.

With the many diameters to be machined on the part, six different spindle speeds are required . . . an easy matter for the Gisholt with its Hydraulic Speed Selector which gives instant, accurate speed changes. Floor-to-floor time for these husky parts is an easy 14.5 minutes.



Setup for machining alloy steel spindles. 2L Saddle Type Lathe.

Simple operations on these parts are made even simpler for the operator because of the ease of changing spindle speeds with the Gisholt Hydraulic Speed Selector.

A LITTLE EXTRA TOOLING—A LOT OF EXTRA PRODUCTION

Ram Type Turret Lathe Completes Pulleys in Single Chucking

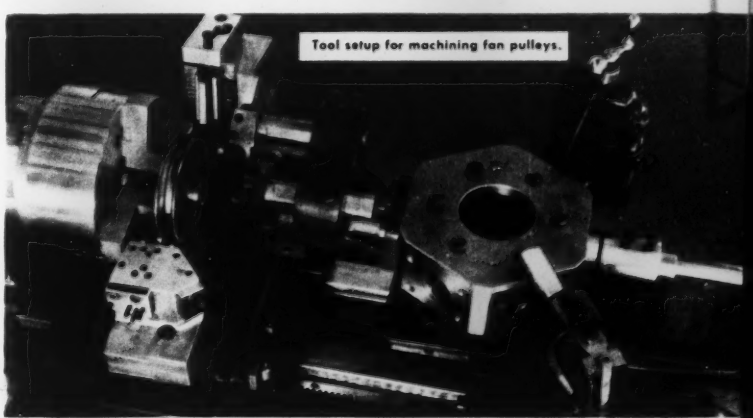
Here's another example of where careful attention to tooling is paying off in increased production. The part is a V-belt pulley and the machine is a standard No. 3 Ram Type Turret Lathe.

The part is held in special top jaws on a standard Gisholt 3-jaw scroll chuck. All boring, turning and facing of the hub are handled by multiple tooling on three faces of the hexagon turret. The large OD is also turned from here.

Special tools are used on the cross slide. In place of the standard quick-indexing tool post on the front of the slide, there is a special tool block. These tools not only rough out the groove, but straddle face the sides as well.

On the rear of the cross slide is another special tool block. Tools here finish-form the groove and finish-straddle face the flanges.

By using special tool blocks on both the front and rear of the cross slide, all machining on these pulleys is done in one chucking.



Tool setup for machining fan pulleys.

GISHOLT

GISHOLT

TIME-SAVING IDEAS

TAKING THE TROUBLE OUT OF TAPPETS . . . WITH SUPERFINISH

9 Spindle Superfinisher Does High Volume Work

Here's another forward step for extending and improving engine performance. This time it's valve tappets that are being Superfinished. Doing this high production job is a Model 55A Superfinisher. Here's how it operates.

The machine has nine spindles in a rotating base. This operates continuously, like a "merry-go-round." Each work spindle has a collet to hold the tappet. Above is a Superfinishing head. Collets and heads rotate in opposite directions. During the machine cycle the flat Superfinishing stones scrub off the amorphous metal on the cam surface of each tappet.

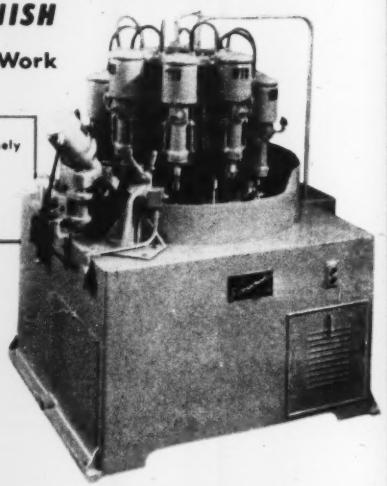
Superfinishing complete, the head is raised and an angular head comes in to chamfer the corners. Then, as the spindle returns to the unloading position, rotating stops, the collet opens, and the tappet is partially ejected. The operator then takes out the finished tappet and replaces it with an unfinished tappet. Production is 600 to 800 parts per hour.

Superfinishing is solving "wearing" problems in many industries.

Superfinisher produces 600 to 800 finely finished valve tappets per hour.

★ ★ ★

Close-up showing special Superfinishing unit for chamfering OD of tappets.



The textbook *"Wear and Surface Finish"* gives the complete story. Ask for your copy.

Better, longer lasting valve tappets are produced in this high production Superfinishing setup.

FLYWHEELS IN ALL SIZES BALANCED ON THIS ONE MACHINE

Handled on Efficient Production Basis

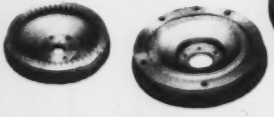
Here is the way flywheels in a large variety of sizes are balanced by a well known engine manufacturer. A Gisholt DYNETRIC Type UV1 Balancing Machine takes care of all production, with parts weighing from 25 to 400 lbs.

A roller and guide arrangement, adjustable to handle flywheels from 8½" to 52", carries the flywheels from the assembly line to the machine and back. As the flywheel is located in position on the Balancer, a hydraulically operated mechanism raises it from the rollers for support by the spindle.

After the quick balancing operation is completed, the flywheel is turned to the indicated angle of unbalance. A sliding prick-punch, which can be set at any radius from 4" to 16" from true center, is then moved to the proper location and activated to mark the spot on the flywheel bottom where drilling correction is made.

This balancing operation, which is part of assembly line operations, results in smoother engine performance, less engine vibration.

DYNETRIC BALANCERS GISHOLT



▲ Type UV1 Balancer for balancing tractor engine flywheels.

▼ A few of the many sizes of flywheels balanced.

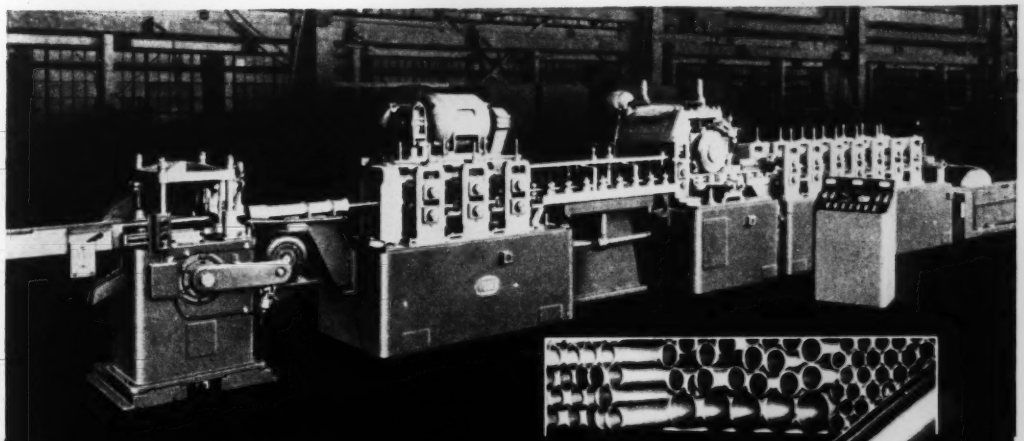
No 11-1252

603

THE GISHOLT ROUND TABLE represents the collective experience of specialists in the machining, surface-finishing and balancing of round and partly round parts. Your problems are welcomed here.

GISHOLT MACHINE COMPANY Madison 10, Wisconsin

TURRET LATHES • AUTOMATIC LATHES • SUPERFINISHERS • BALANCERS • SPECIAL MACHINES



Electric Weld Pipe and Tube Mills

1300% Increase in 12 years

In the brief period of twelve years, from 1938 to 1950, the manufacture of electric welded pipe and tubing in the U. S. A. grew nearly 1300%, becoming one of the child prodigies of the American metal working industries.

The beginning of this development was sparked by the introduction of the revolutionary new Yoder electric resistance welder, and followed by many other Yoder improvements in cold process pipe and tube making equipment. The latest of these is the highly efficient Yoder 4-in-1 cross type transformer.

Year by year, Yoder has built, installed and serviced more electric-weld tube mills than all other builders combined. The experience so gained has been invaluable in bringing Yoder mills to their present state of pre-eminence.

Most significant is the fact that the demand for electric welded pipe and tubes has expanded faster than the supply.

If you have been thinking of making any grade or grades of pipe and tubing, from steel or non-ferrous metals, in sizes from ¼" up to 30 or 40-inch diameter, Yoder literature, information and recommendations are yours for the asking.

THE YODER COMPANY • **5502 Walworth Avenue, Cleveland 2, Ohio**

Complete Production Lines

- ★ **COLD-ROLL-FORMING and auxiliary machinery**
- ★ **GANG SLITTING LINES for Coils and Sheets**
- ★ **PIPE and TUBE MILLS–cold forming and welding**

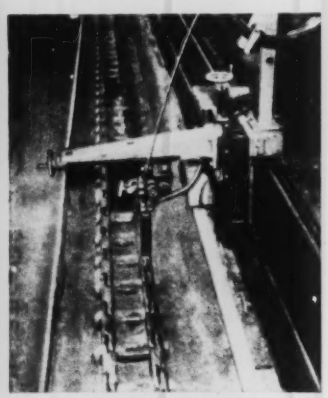
ENGINEERING YODER MANUFACTURING

LINDE'S News of Metalworking

Worn Parts Rebuilt Economically by UNIONMELT Welding

Repair of worn tractor parts is most practical and economical with specially developed fixtures on which standard UNIONMELT welding units are mounted. The metal deposited by UNIONMELT welding is so smooth that no grinding or finishing is required. Experience indicates that resurfaced areas will wear as long as new parts.

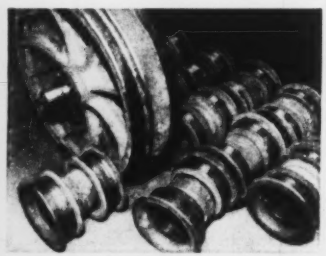
The Berkeley "Conservall" fixture is designed especially for rebuilding crawler tractor track links or rails without disassembling them. The track is placed in a trough and clamped in position. A LINDE side beam carriage



Tractor rail links rebuilt in "Conservall" machine by UNIONMELT welding. Cams automatically control welding action for each link.

moves the UNIONMELT welding equipment over the positioned track and the welding of each link is automatically started, stopped and accurately controlled. Rollers, idlers, sheaves, and other circular work can also be welded or resurfaced on another section of the machine.

The "Leader" machine is also available for rebuilding both cylindrical and flat parts. Rollers are rebuilt on top of the machine. Larger parts, such as idlers, are mounted in the chuck at the side of the machine as shown. With the flat work attachment, parts such as disassembled track rail links, grousers, bulldozer blades, end bits and fabricated members can be resurfaced easily. This attachment is operated by a gear which is mounted in the chuck.



These tractor rollers and an idler were rebuilt at a speed of 30 in. per min. by UNIONMELT welding.

With both machines, the wheels can be tilted for rebuilding the flanges. It takes only 80 to 90 minutes to rebuild a D8 track roller. Idlers take about three times as long.

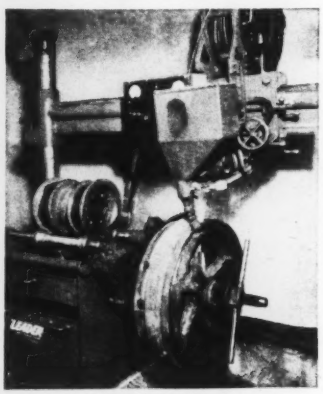
OXWELD 1928 rod is normally used in making these repairs. When wear is excessive, OXWELD 296 rod is sometimes used for the initial buildup which is then finished with OXWELD 1928 rod. For such resurfacing, use either Grade 80 or Grade 90 UNIONMELT welding compositions.

For some services, a finishing pass with a higher alloy tube rod is applied to produce a harder surface. While material of almost any hardness can be applied, one combining hardness and toughness lasts longer than one of higher hardness that tends to spall and chip. As deposited, OXWELD 1928 material has a hardness of about Rockwell C-25, but in service the working surfaces actually develop properties which cause them to outwear deposits that are substantially harder.

Advantages of UNIONMELT Build-up

UNIONMELT welded resurfacing is especially attractive with these automatic machines which readily permit deposit rates of 20 lbs. per hour. Savings in time and the advantages of a smooth uniform deposit justify the initial investment in automatic equipment. Important in these times is the conservation of metal realized with the process. The use of approximately *one hundred pounds of weld metal saves replacement of 2,000 to 3,000 pounds of new parts.*

LINDE's engineers and technicians will be glad to give further information about UNIONMELT welding. Telephone or write today.



UNIONMELT welding head on "Leader" fixture rebuilds rollers and idlers. Rollers are welded on top of the machine, idlers at the side, and flat parts, depending on their size, can be welded on top of the machine or in the flat work attachment.

LINDE AIR PRODUCTS COMPANY
A Division of Union Carbide and Carbon Corporation
30 East 42nd Street UCC New York 17, N. Y.
Offices in Other Principal Cities
In Canada: Dominion Oxygen Company, Limited, Toronto

The terms "Linde," "Oxweld," and "Unionmelt" are registered trade-marks of Union Carbide and Carbon Corporation.

Stopping Rust with RUST-OLEUM 769 D.P. Red Primer

RUST-OLEUM

Look for this label. Be sure it's genuine RUST-OLEUM!

All Colors, Aluminum and White—
Beautifies As It Protects!

This practical coating may be applied directly over surfaces already rusted without removing all the rust! Simply wirebrush and use sharp scrapers to remove rust scale and loose particles . . . sandblasting and chemical pre-cleaning are not usually required. Easy to apply by brush, dip, or spray . . . dries to a firm, pliable coating. Cut your maintenance costs, save metal — with RUST-OLEUM! Prompt delivery from Industrial Distributor stocks in principal cities.

STOPS RUST!

RUST-OLEUM CORPORATION
2531 Oakton Street, Evanston, Illinois

FREE SURVEY: A RUST-OLEUM specialist will gladly survey your rust problems. He'll make specific tests and recommendations. No cost or obligation. See Sweets for complete catalog and nearest RUST-OLEUM distributor, or write for literature on your company letterhead.

CLIP THIS TO YOUR LETTERHEAD
MAIL TO: RUST-OLEUM CORPORATION
2531 Oakton Street • Evanston, Illinois

- ☐ Have a Qualified Representative Call
- ☐ Full Details on Free Survey
- ☐ Complete Literature
- ☐ Nearest RUST-OLEUM Source

For this Automobile Fan Shaft . . .

The right Republic Steel Saved

40% IN COST . . .

3 OPERATIONS . . .

3 INSPECTIONS . . .

AND 1 BIG HEADACHE

Here's another case where Republic Carbon-Corrected Bar Stock replaced a carburizing steel.

Before they switched to Republic Carbon-Corrected Steel Bar Stock for automobile fan shafts, Schwitzer-Cummins Company had been carburizing the steel shafts after machining. This ran up costs, created the headache of carburizing and inspecting, tempering and inspecting, cleaning and inspecting, and finally straightening warped shafts and inspecting.

The Schwitzer-Cummins metallurgist called on our Republic 3-Dimension Metallurgical team . . . the Field Metallurgist, backed up at home by the Laboratory and Mill Metallurgists. The decision was made to change over to Republic Carbon-Corrected AISI-C 1144 Bars. Now, induction hardening and inspection takes the place of the previous 8-step procedure. No warped shafts to straighten, and a better fan shaft that will last longer in your car or truck. Cost is reduced up to 40%.

The help our Republic 3-Dimension Metallurgical Service gave to Schwitzer-Cummins metallurgists is also available to you. It can help you make better products at lower cost. When shall we call?

REPUBLIC STEEL CORPORATION

Alloy Steel Division • Massillon, Ohio

GENERAL OFFICES • CLEVELAND 1, OHIO

Export Department: Chrysler Building, New York 17, N. Y.

Republic COLD DRAWN REPUBLIC STEEL

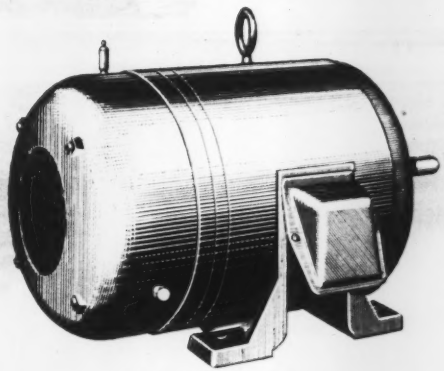
ALLOY STEEL BARS

Other Republic Products include Carbon and Stainless Steels—Sheets, Strip, Plates, Pipe, Bars, Wire, Pig Iron, Bolts and Nuts, Tubing

ELECTRO DYNAMIC

INDUSTRIAL MOTORS

Built to OUTLAST



Industry has learned
what marine engineers
have known since 1880

ELECTRO DYNAMIC
builds great motors

Electro Dynamic motors were originally engineered to withstand the terrific twisting and tossing, the gruelling sustained performance that go with use aboard submarines and surface ships. Today's E.D. industrial motors inherit this ruggedness and staying power. They are built to outlast other motors—in the roughest, toughest jobs you can give them.

Their powerful construction resists stress... prevents twisting and distortion. Husky cast frames assure rigidity and combat corrosion. Special care and superior insulating materials go into the WINDINGS ..."the heart of the motor"... to assure many added years of dependable, low-cost operation.

Can you profit from this *extra* strength and durability in E.D. motors? All standard enclosures... 1 to 250 h.p. Write for literature today.

E.D. also makes a complete line of Direct Current Motors and Generators. Literature on request.

ELECTRO DYNAMIC • Division of General Dynamics Corporation • Bayonne, New Jersey

AUTHORIZED SERVICE IN PRINCIPAL CITIES

CUT COSTS OF... INSTALLATION WIRING MAINTENANCE

with CLARK Type "CY" COMBINATION AC MOTOR STARTERS

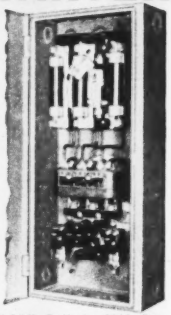
Clark type "CY" Combination Starters offer many cost-saving advantages.

They cut installation costs—only one cabinet to mount.

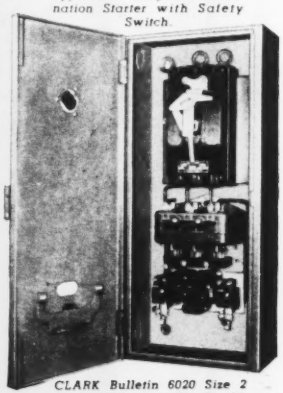
They cut wiring costs—simply connect to power line and run leads to equipment to be controlled.

They simplify inspection and reduce maintenance to a minimum. Moving contacts are inspected by merely pushing down the contact bars—stationary contacts by opening snap-action cover clips and releasing lower arc shield. Because the arcs are magnetically rotated pitting and corrosion of the twin-break silver-alloy contacts are negligible. However, if contacts must be replaced, this can be quickly done with a screw driver and a wrench, without removing starter from cabinet. These, like all other parts, are front removable. And the entire control unit—on baseplate—can be lifted from the cabinet after disconnecting leads and loosening 3 screws.

Type "CY" Combination Starters are designed in many styles, sizes and enclosures. Shown here are Bulletin 6018 combining a fusible or non-fusible safety switch and a size 2 type "CY" starter—and Bulletin 6020 combining a size 2 type "CY" starter and a circuit breaker—all in a single, neat enclosure.



CLARK Bulletin 6018 Size 2 Type "CY" Magnetic Combination Starter with Safety Switch.



CLARK Bulletin 6020 Size 2 Type "CY" Magnetic Combination Motor Starter with Circuit Breaker.

Cut your installation, wiring and maintenance costs with Clark Type "CY" Combination Starters

THE CLARK CONTROLLER CO.

ENGINEERED ELECTRICAL CONTROL • 1146 EAST 152ND STREET, CLEVELAND 10, OHIO

A Program for 30 million new Americans

LISTEN to the voices of 30 million new Americans. They are answering the pessimists who say we are threatened with depression because we can't keep our farms and factories busy.

Let these pessimists read the future in the census returns. There is a tremendous upsurge in our population. Last year nearly 4 million babies were born. By 1960 we shall total 170 million people--30 million more than when war ended in 1945. This adds to our domestic market more people than there are in Canada and Australia combined.

Providing for these 30 million new Americans can keep our production machinery going at capacity. They call for new hospitals, schools and churches. Larger families need bigger houses to replace postwar houses that are too small now. More and bigger families need improved home equipment and more new automobiles. In short, to maintain and improve living standards for our children, we must work harder than ever before. To supply the needs of our 1960 population, including adequate national defense, it is estimated that the productivity of the individual worker must increase at least 30%, with additional investment of over 200 billion dollars in capital facilities.

There should be no room in this picture for depression. But we must have economy in government, elimination of waste and extravagance and a reduction of taxes and public debt. If we encourage private incentive, thrift and investment, we can bring about the greatest advance in health, wealth and happiness that America has ever known.

QUALITY V YOUNGSTOWN SERVICE

The Youngstown Sheet and Tube Company

General Offices--Youngstown 1, Ohio

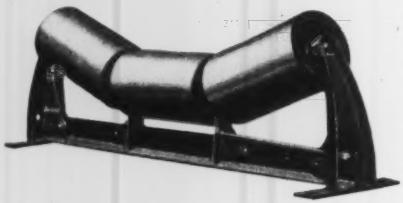
Export Offices--500 Fifth Avenue, New York

MANUFACTURERS OF CARBON ALLOY AND YOLOY STEELS

RAILROAD TRACK SPIKES - CONDUIT - HOT AND COLD FINISHED CARBON AND ALLOY BARS - PIPE AND TUBULAR PRODUCTS - WIRE - ELECTROLYTIC TIN PLATE - COKE TIN PLATE - RODS - SHEETS - PLATES.

2 ways L-B Belt Conveyors
cost you less in the long run

1 LINK-BELT Idlers require minimum lubrication and adjustment



BY MINIMIZING maintenance . . . holding "down-time" to a new low . . . reducing power requirements—Link-Belt Roller Bearing Idlers save you money.

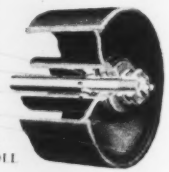
And, because of standardized design, Link-Belt gives you the famous "100" Idler or the heavy-duty "200" Idler at a cost lower than you'd expect. You can choose from the full Link-Belt line of troughing, impact-cushioning, belt training and flat belt idlers in a wide range of roll diameters and belt widths. A complete line to meet any requirement.

Grease in, dirt out, cartridge type unit seal preserves lubricant. No springs, no loose parts, no sliding metal-to-metal contact.

Large grease reservoir prolongs lubrication intervals.

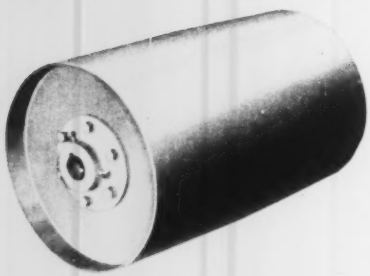
Precision roller bearings maintain alignment.

Concentrically counterbored and tourneled full length central tube and counterbored roll shell are continuously welded to dished heads to maintain balance and bearing alignment.



CUTAWAY OF "100" ROLL

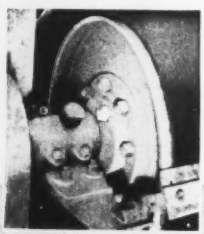
2 LINK-BELT Welded Steel Pulleys minimize shaft deflection



MODERN Link-Belt welded steel design gives you lower maintenance and longer pulley life in more ways than one. Water- and dust-tight construction preserves balance, halts corrosion. Removable hubs—key seated in line with two set-screws—are interchangeable with many other shaft sizes.

And for reducing shaft deflection (see below), you can't possibly get better protection than with Link-Belt Welded Steel Pulleys.

Since shaft bending moment increases in proportion to the distance between shaft bearing and pulley hub, it's easy to see why Link-Belt Welded Steel Pulleys are your best bet. Note how the bearing support and hub of the pulley are mounted with minimum clearance. That's possible because Link-Belt hubs are flush with the pulley face.



BELT CONVEYORS

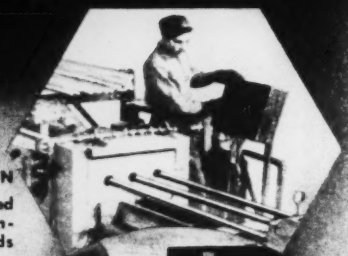
LINK-BELT COMPANY: Chicago 9, Indianapolis 6, Philadelphia 40, Atlanta, Houston 1, Minneapolis 5, San Francisco 24, Los Angeles 33, Seattle 4, Toronto 8, Springs (South Africa). Offices, Factory Branch Stores and Distributors in Principal Cities.

LINK-BELT

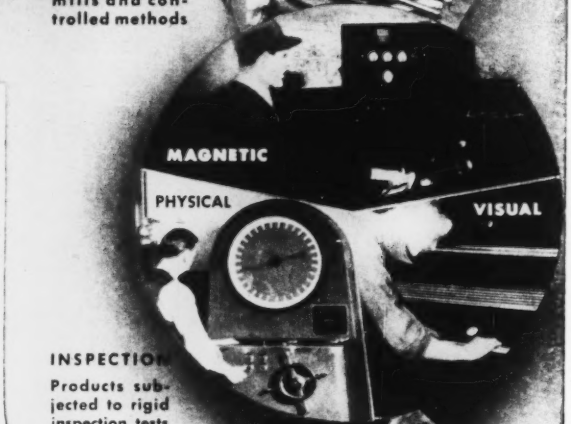
BRISTOL
CONNECTICUT
2-9581
CHICAGO
MOHAWK
4-6622
PLYMOUTH
MICHIGAN
2310
Ann Arbor
MICHIGAN
3-4258
DAYTON
KENMORE
5135
CORRY
PENNSYLVANIA
3-8201
Milwaukee
BROADWAY
2-1912
RING
any phone for
SPRING
action . . .
WALLACE BARNES COMPANY
BRISTOL, CONNECTICUT
THE WILLIAM D. GIBSON COMPANY
1800 CLYBOURN AVE. CHICAGO 14,
RAYMOND Manufacturing COMPANY
CORRY, PENNSYLVANIA
BARNES-GIBSON-RAYMOND
40300 PLYMOUTH RD. PLYMOUTH, MICH.
B·G·R COOK PLANT
ANN ARBOR MICHIGAN
F. N. MANROSS AND SONS CO.
BRISTOL CONNECTICUT
OHIO DIVISION
1712 EAST FIRST ST. DAYTON, OHIO
DUNBAR BROTHERS COMPANY
BRISTOL, CONN.
MILWAUKEE DIVISION
341 E. ERIE ST. MILWAUKEE, WIS.
THE WALLACE BARNES COMPANY LTD.
HAMILTON, ONT. CANADA
DIVISIONS OF ASSOCIATED SPRING CORPORATION AND CANADIAN AFFILIATE

How MACHINABILITY-*PLUS* *is developed in* B&L COLD FINISHED BAR STEELS

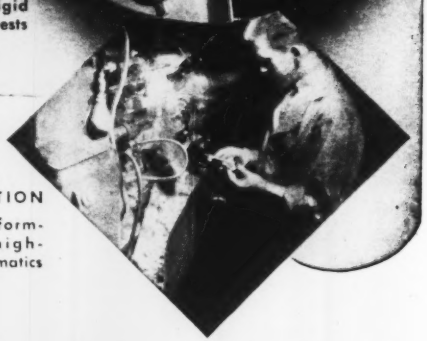
SPECIFICATION
Selected steel grades to B & L specifications



PRODUCTION
Modern-equipped mills and controlled methods



INSPECTION
Products subjected to rigid inspection tests



APPLICATION
Better performance on high-speed automatics

The production of B&L Free-Machining Steels is a quality-controlled operation, based on the know-how gained in three-score years of fine craftsmanship.

It is the sum total of selected steel bars and modern cold finishing processes that advances the machinability to new values which are rigidly maintained by B&L inspection standards.

These plus-machining qualities of B&L Cold Finished Bars will pay-off on your production line . . . specify them for extra output and low unit cost in parts fabrication.

Refer your machining problems to B&L engineers for selection of steel grades to fit your job

Find your Hidden Scrap
It means more STEEL

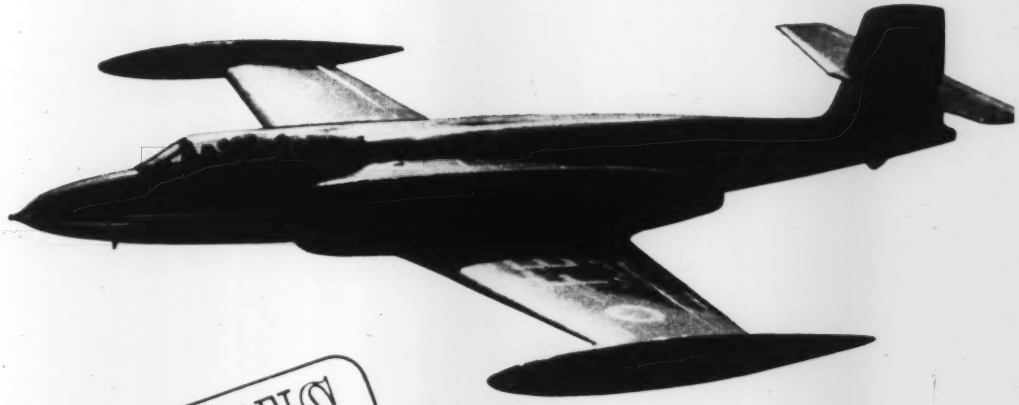
BLISS & LAUGHLIN, INC.

GENERAL OFFICES: HARVEY, ILLINOIS

PLANTS: HARVEY, ILL. • BUFFALO, N. Y. • MANSFIELD, MASS.

SALES OFFICES IN ALL PRINCIPAL CITIES

B&L SINCE 1891



STEVENS SPECIFIED

Precision Performance of Canada's "Orenda" Jet... Demands Precision Plating:

The A. V. Roe Company, Ltd., manufacturer of the famous ORENDA jet engine for the Avro CF-100 "CANUCK" all-weather fighter *must* have precision plating.

That's why they selected Frederic B. Stevens of Canada, Ltd., to *completely* outfit the Malton, Ontario, Jet Engine Plant of the A. V. Roe Company, Ltd., with plating equipment.

Plating, anodizing, chromating and blackening machines are all by Stevens. That's because extreme accuracy is obtained with Stevens equipment. The A. V. Roe Company, Ltd., know *specification* processing is a routine production operation when they use Stevens.

The well-known dependability of Stevens machines in operation is another important factor. They are ruggedly built to assure long trouble-free service.

Stevens Model B Automatic Rack-Type Plating Machine.

If you have a precision plating and processing problem, see your nearest Stevens representative or write direct . . . *FREDERIC B. STEVENS, INC., Detroit 16, Michigan.*

METAL FINISHING EQUIPMENT AND SUPPLIES SINCE 1883

FREDERIC B. STEVENS INCORPORATED

DETROIT 16, MICHIGAN

HOUGHTON

RUST-VETO 377

... the answer to most of your indoor rust prevention problems

LOOK!

All these advantages are combined in ONE multi-purpose rust preventive!

- ✓ **HIGH POLAR ATTRACTION** — *making it cling to metals*
- ✓ **WATER DISPLACING ABILITY** — *removes moisture from metal surfaces*
- ✓ **RESISTS OXIDATION** — *keeps protective film intact*
- ✓ **WON'T STAIN** — *used effectively on all metals*
- ✓ **SPRAYABLE** — *can be sprayed at 40° F.*
- ✓ **THIN FILM** — *(average .0003") — practically colorless*
- ✓ **LOW COST COVERAGE** — *over 1300 sq. ft. per gallon*

We believe no other rust preventive possesses all of the properties combined in Rust Veto 377.

This modern, thin-film polar type preventive withstands severe humidity tests and is a "natural" for indoor uses. It passes rigid salt spray protection tests. It deposits a thin, tough film which clings to parts but is easily removable.

For indoor storage you can't do better than to use Rust Veto 377. Get latest bulletin from your Houghton Man or write to E. F. Houghton & Co., Phila. 33, Pa.

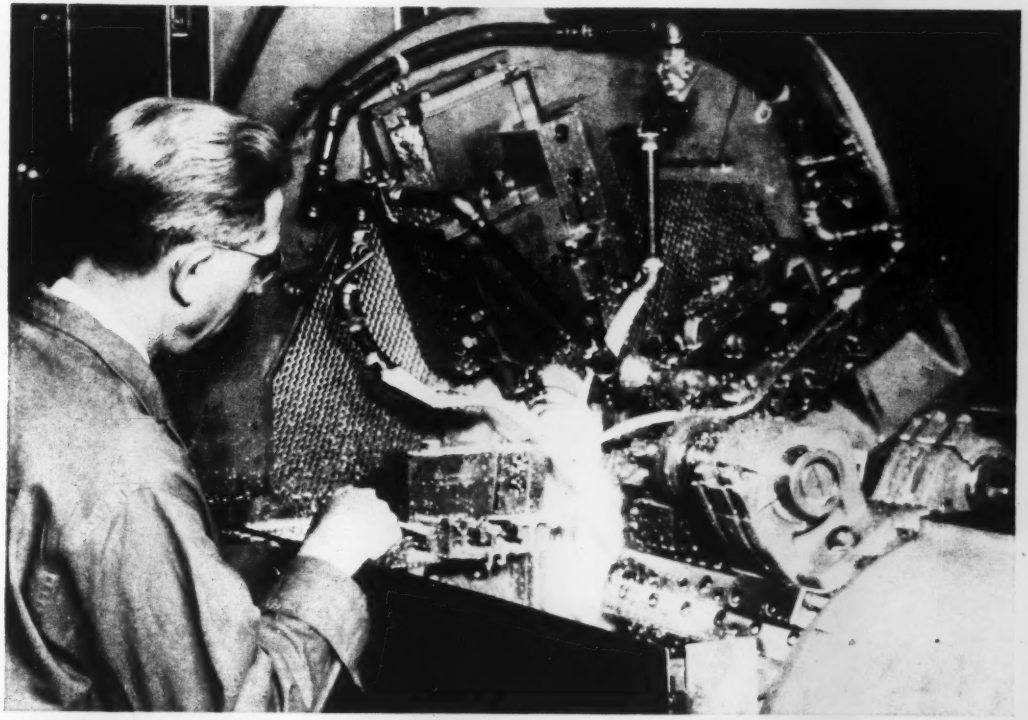
. . . a product of

E. F. HOUGHTON & CO.

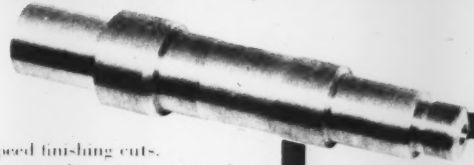
PHILADELPHIA · CHICAGO · DETROIT · SAN FRANCISCO

Ready to give you on-the-job service . . .

If a government specification product for Type P-1 preservative (AXS-1759 Gr. 2) is required, order *Cosmoline 377*.



MODEL M...more than 6½ times faster on this shaft!



You can spot one of the important reasons for this production increase right in the design of the Acme-Gridley Model M Single Spindle Automatic. There are three automatic spindle-speed ranges to give the correct surface speed for any kind of cut, any diameter. On this job, for example, the operation sequence goes from carbide cuts, to high-speed steel for forming cuts, to die-head threading—and back to high-speed finishing cuts.

There are other time-saving features, too: independent camming for the eight tool slides, to permit combining cuts; wide, open tooling zones, for easy access; heavy, rigid frame construction, to permit the use of carbide tools; simple camming, for quick change-overs.

These and many others are explained in Bulletin M-50. Be sure to ask us for your copy.

JOB FACTS

PART	Steel Sprocket Shaft, $5\frac{3}{4}$" long
OPERATIONS	10
MACHINE TIME	1 Min., 50 Sec.
FORMER MACHINE TIME	12 Min. (Engine Lathe)
MACHINE	$3\frac{1}{2}$" Acme-Gridley Model M Single Spindle Automatic.

The NATIONAL ACME CO.

170 EAST 131st STREET • CLEVELAND 8, OHIO

Acme-Gridley Bar and Chucking Automatics: 1-4-6 and 8 Spindle • Hydraulic Thread Rolling Machines • Automatic Threading Dies and Taps • The Chronolog • Limit, Motor Starter and Control Station Switches • Solenoids Centrifuges • Contract Manufacturing

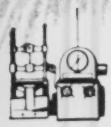
WHEN YOU THINK OF

...TAPPING SCREWS

Think of

CENTRAL

ALL HEADS STYLES • ALL METALS



RESEARCH — Central's complete high quality line of tapping screws includes Types A-B-C-U and types 1-23 and 25 thread cutting varieties, scientifically developed over a period of years to insure trouble-free assemblies along production lines. They eliminate pretapping costs in hard or soft metals, fibre, asbestos, plastics and porous castings.

KNOW-HOW — Produced on the latest type, high-speed equipment to hairline tolerances under rigidly controlled inspection, Central Tapping Screws are heat-treated to predetermined strength requirements and tested in our own laboratories.

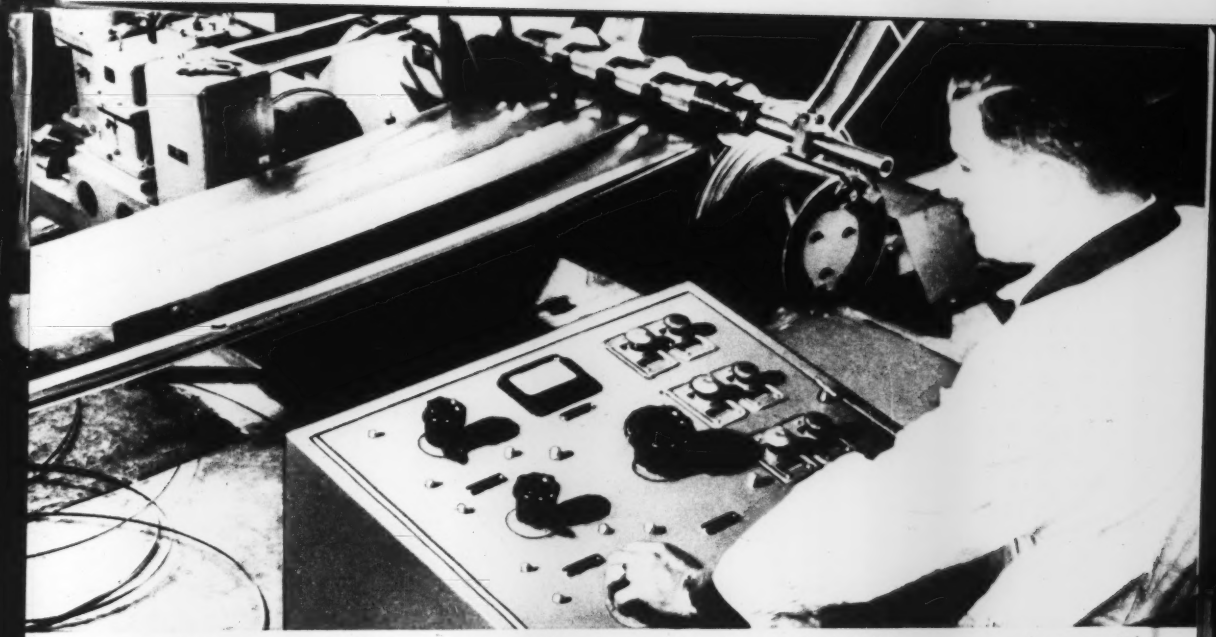
QUALITY — Central's Tapping Screws are known for their clean, uniform threads and sharp points or cutting edges. Sturdy dependable types A-B-C-U and types 1-23 and 25 are obtainable in all head styles and sizes.

"You Can Depend on Central"

CENTRAL SCREW COMPANY

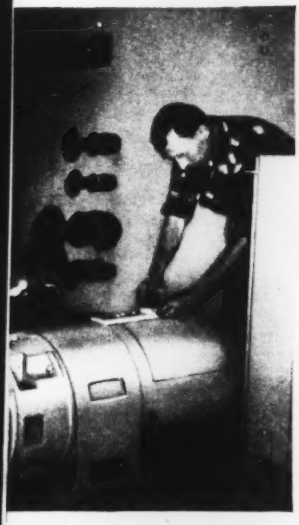
3501 SHIELDS AVE., CHICAGO 9, ILLINOIS

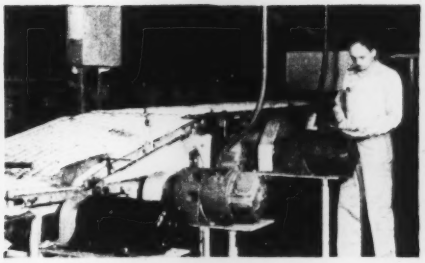
3028 E. ELEVENTH ST., LOS ANGELES, 23 CALIF. • 149 EMERALD ST., KEENE, N. H.



G-E SPEED VARIATORS, operated by central control panel (above) were chosen by E. F. Hauserman Co. of Cleveland, Ohio for its steel slitting operation. General Electric Speed Variators provide flexible performance in the 1-200-hp range at moderate cost. For even greater accuracy and versatility in automatic operation, these drives may include amplidyne or electronic regulators.

These G-E Adjustable-speed Drives can help you boost your output, too!





G-E THY-MO-TROL* drives assure the Keebler Weyl Baking Co. of Philadelphia of proper baking for many different products. This electronic control is particularly suited for precise adjustable-speed in 1/4 to 10-hp drives—offers speed ranges to 100:1 and more.

◀**G-E ACA MOTORS** give the Ford Motor Company a simple, compact, and lowest-cost method of controlling pump speeds at its oxygen generating plant, leased from Air Products Inc. This adjustable-speed motor requires no conversion equipment—an a-c induction motor with stepless speed adjustment by a simple twist of a dial.

*Reg. trade mark of General Electric Co.

GENERAL ELECTRIC

WHICH G-E DRIVES ARE BEST FOR YOU?

Because only General Electric makes *all major types* of electric adjustable-speed drives, it is best qualified to help you select the *right drive*. Send for these informative bulletins.

- ☐ A This 26-page manual describes *all* four types of drives and where to apply them. Bulletin GEA-5334.
- ☐ B Lower cost, simplest a-c drive Bulletin GEA-4883.
- ☐ C More flexibility, moderate cost. Bulletin GEA-5335.
- ☐ D Top performance, ¼-10 hp Bulletin GEA-5337.
- ☐ E Top performance, 1-200 hp Bulletin GEA-5336.

General Electric Company,
Section L 646-19
Schenectady 5, N.Y.

Please send me the bulletins checked

- ☐ for reference only
- ☐ for planning an immediate project

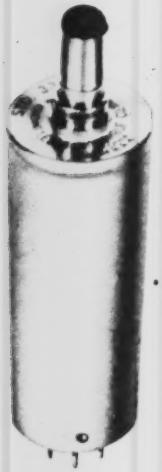
NAME .....

COMPANY .....

ADDRESS .....

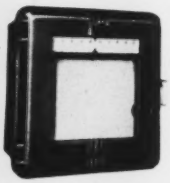
CITY ..... **STATE** .....

A lot of engineering for a Component!



Converter's job in Speedomax instruments is to receive the (often very small) direct current signal which is related to the temperature, stress pH or other condition being measured, and produce an alternating voltage. This output is amplified, and then directs the balancing system to measure, record, and if desired control.

and every Speedomax user benefits by it!



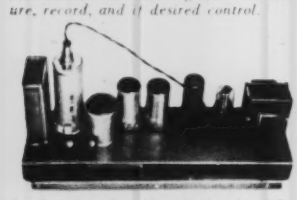
● The operating precision of the thousands of Speedomax Recorders and Controllers which serve industry and science begins with the engineering of components like this Converter. Our specifications apply at all stages—all the way back to the plants which make metals, insulation materials, etc., for us. These specs represent also the best thinking of our suppliers' engineers. The resulting materials are thus quality-controlled for us—and us alone.

From these materials our engineers tell our factory how to make converter parts to truly tight specifications. Some parts require principally flatness, or elasticity, or dimensional stability. Reeds need correct natural frequency. Many parts of course combine various needs; each gets its requirements.

Life tests show Fidelity and Stamina. Ingenious and often original design creates from these parts a converter with noise level equivalent to only 0.2 microvolt in an emf potentiometer circuit. And this fidelity promotes accurate measurement and control.

Running on life tests since 1948, present-model converters are today still well inside performance tolerances. Such a run equals 21.9 years of 8-hours-a-day, 200-days-a-year-service—or 1.9 years more than the present age of the first Speedomax.

This kind of engineered performance is also built into the amplifier, slidewire, motor and scores of other exclusively Speedomax parts. It's at your service whether you want to control temperature of steel billets, or record the laboratory studies of steel molecules. Call on L&N application engineers in selecting the exact range (from among thousands) and the exact measuring circuit (from among 2300) to meet your needs. Write our nearest office, or 4957 Stenton Avenue, Philadelphia 44, Pa.



Good engineering shows in this Amplifier's thorough filtering, high impedance, and plug-in connection to the test of the Speedomax.

Good engineering shows in this Slidewire's non-inductive winding and in absence of any flexible leads which might form inductive loops.

Good engineering shows in this balancing motor's small size, and in its torque ample to operate accessory control and signalling fitments.

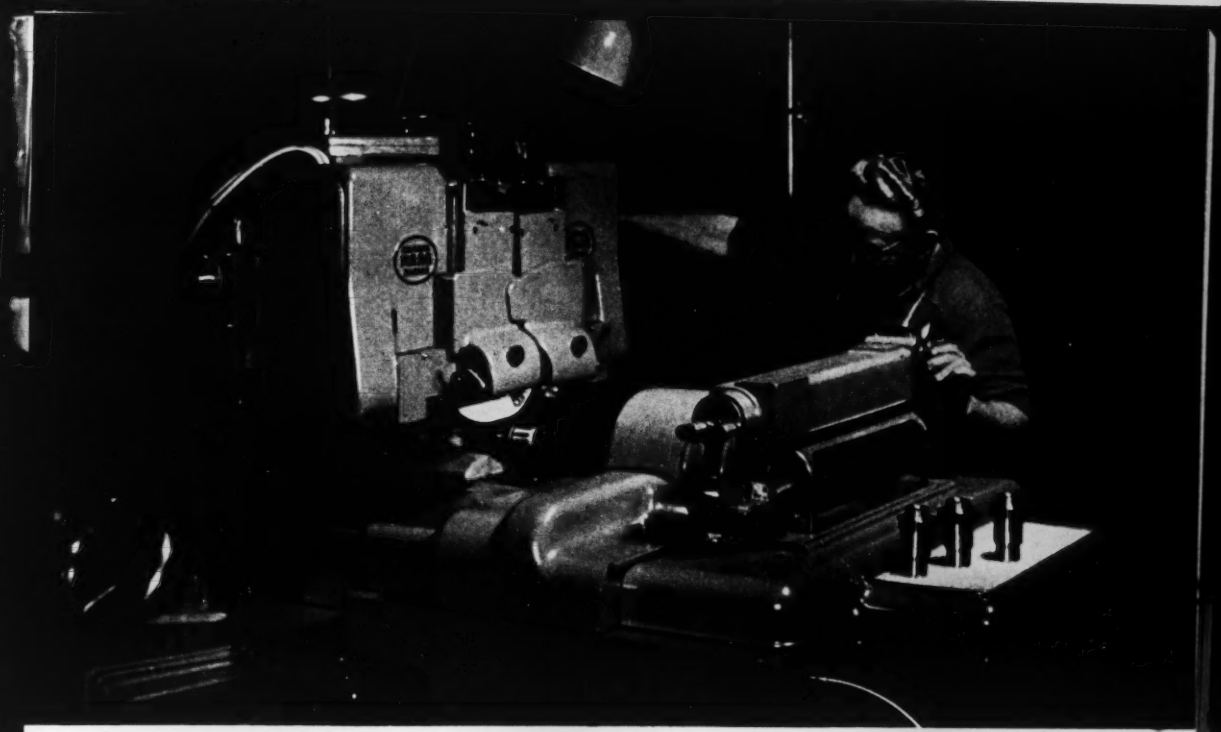
CAREER OPPORTUNITIES AT L&N

Expansion program of this long established firm has many features to attract outstanding recent graduates in engineering and science. Opportunities are in sales field engineering, product and application engineering, research, advertising, market development. Widely respected policies assure recognition of progress and achievement. Address Personnel Manager for preliminary interview at nearest of 17 L&N offices.

LEEDS NORTHRUP

instruments • automatic controls • furnaces

Jrl Ad ND46(6c)



How to slow down the fastest aircraft engine ever made!

Though the jet engine's record breaking speed is an asset in a fighter plane, it's a handicap in driving many vital accessories of a plane.

Hydraulic pumps, generators, radar equipment can't be driven directly from a shaft that turns 16,000-38,000 rpm. To reduce the shaft speed to 2,000 rpm without cutting the engine speed, proved a tricky problem.

Barium's Jacobs Aircraft Engine Co., Pottstown, Pa., solved it by grinding special gear transmissions to precision tolerances on Swiss gear grinders.

Jacobs gear specialists can do as well for you. Other members of Barium Steel Corporation can supply your other steel needs. This group of strategically located companies controls quality from blast furnace to end product, works as a self-contained unit to speed urgently needed orders.

Address inquiries to Barium, 25 Broad Street, New York City.

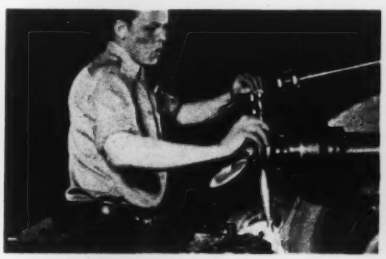
Barium

A coordinated effort of 15 companies working in steel

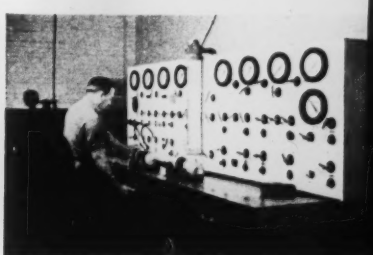
MILL PRODUCTS • SHAPES TO ORDER • END PRODUCTS

BAYONNE BOLT CORP. • CENTRAL IRON AND STEEL COMPANY • CHESTER BLAST FURNACE • CLYDE IRON WORKS, INC. • CUYAHOGA SPRING COMPANY • ERIE BOLT AND NUT COMPANY • GEOMETRIC STAMPING CO. • GLOBE FORGE, INCORPORATED • INDUSTRIAL FORGE & STEEL, INC. • JACOBS AIRCRAFT ENGINE CO. • KERMATH MANUFACTURING CO. • KERMATH LIMITED (CANADA) • PHOENIX BRIDGE CO. • PHOENIX IRON & STEEL CO. • WILEY MANUFACTURING CO.

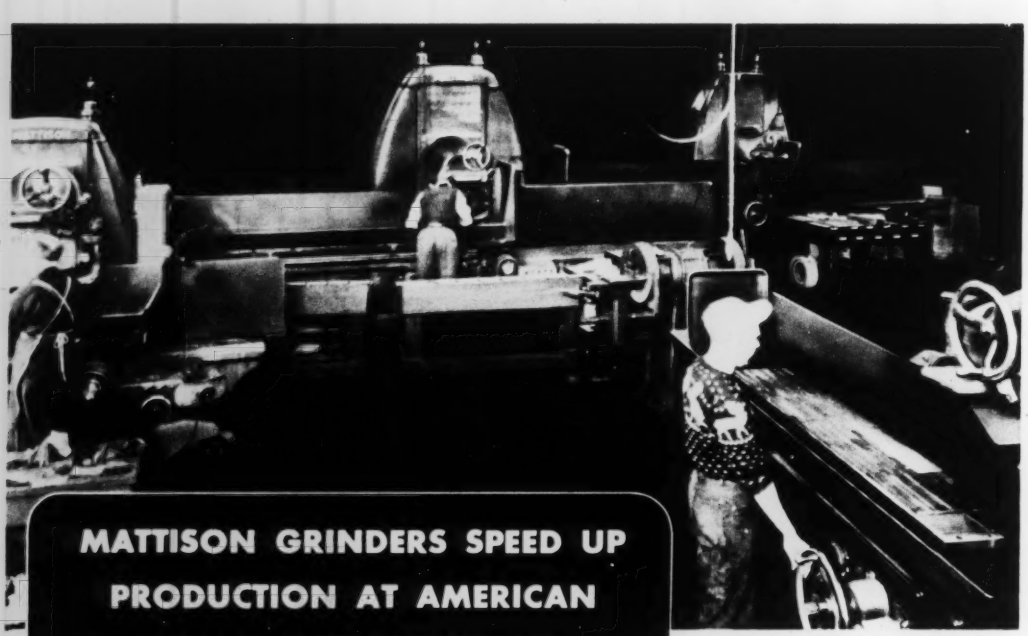
This inspector tests Jacobs gears for accuracy in a controlled temperature area. Tolerances to .0001 in. are needed to meet high load requirements on many parts such as those for aircraft gears.



This worker's skilled handling of the latest grinding equipment helps maintain Barium's Jacobs Aircraft Engine Co.'s leadership in spur and helical gears, from tiny sizes up to 12 in. diameter.



This board tests hydraulic parts with rapid precision. In addition to auxiliary drives and other jet components, Jacobs makes complete reciprocating aircraft engines and auxiliary power plants.



MATTISON GRINDERS SPEED UP PRODUCTION AT AMERICAN SAW & MFG. COMPANY

● The four Mattison High Powered Precision Surface Grinders shown above are used by American Saw & Mfg. Company for the grinding of annealed tool steel strips and bars on a real production basis in the manufacture of Lenox Precision-Master Ground Flat Stock. Exacting manufacturing specifications demand excellent finishes within close limits of accuracy.

The massive double column support, high power and rigidity of construction of the Mattison Grinder combine with accuracy and speed of operation to insure consistent precision results on a high production basis for American Saw & Mfg. Company. For complete information regarding the capabilities of the Mattison High Powered Precision Surface Grinder send for free circular.

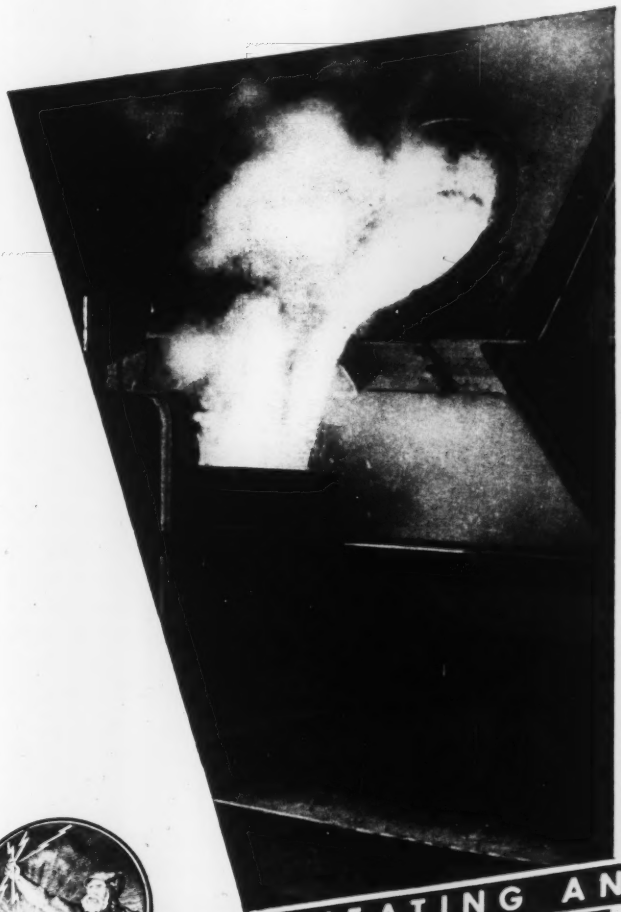
MATTISON MACHINE WORKS

ROCKFORD · ILLINOIS

Alloy savings

PAY FOR AJAX-NORTHRUP FURNACES

in three years



Induction melting saves tons of ferrochrome a month in one east coast stainless steel foundry . . . metal that was previously "burned up" in other electric furnaces.

With a three shift monthly melting capacity of 1,000,000 pounds, a 2% reduction in chromium losses made the difference. Dollar savings up to $60,000 a year are enough to pay for the equipment in a year and a half—three years on a reduced schedule.

This is only the beginning—savings in other critical and expensive alloys are also appreciable. Here are typical metal recovery figures from another Ajax-Northrup foundry melting 18-8 stainless:

Ni:	100%	Cr:	99%	Mn:	90%
Si:	94%	Mo:	95%	Cb:	92%

Besides saving metals, Ajax-Northrup furnaces melt at high speed, with extremely close control of analysis and temperature. A typical foundry, with never more than one 600-pound furnace in operation on a two shift basis, pours almost 250,000 pounds of high-melting point alloys a month. Pouring temperatures are controlled within 20°F, composition of every element within 0.25%.

Performance like this can save critical alloys for you, too. Whether you melt 8 ounces of platinum, or 8 tons of steel, write us today.

SEND FOR NEW INDUCTION HEATING AND MELTING BULLETIN

140.

FOR HEATING AND MELTING

AJAX NORTHRUP

AJAX ELECTROTHERMIC CORPORATION

AJAX PARK
TRENTON 5, NEW JERSEY

Associate Companies

AJAX ELECTRO METALLURGICAL CORP.
AJAX ELECTRIC FURNACE CORPORATION
AJAX ELECTRIC COMPANY, INC.
AJAX ENGINEERING CORPORATION

Somewhere in the future...!

Perhaps one day soon, you'll want to . . . have to . . . produce THREADED PARTS *faster, more accurately!* The time is sure to come, for with today's speed-up of production, government requirements, high speed tools, faster equipment, newer, better metals, advanced engineering methods and high civilian demands, you'll be looking about for a machine that will produce your THREADED PARTS *faster, at lower costs!*

When that time comes . . . and it will . . .

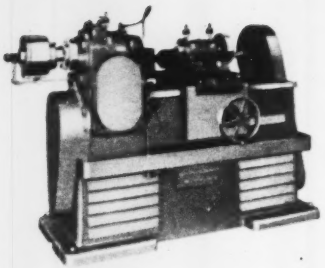
LOOK TO A COULTER

TODAY, COULTER OFFERS YOU 3 METHODS TO FASTER THREADING...AUTOMATICALLY

Either machine is right for you. Years ahead in design, construction, workability, output, versatility, accuracy . . . each tried, tested and proven!

So today... do it faster, better AUTOMATICALLY, with a COULTER!

Production Machines Since 1896



"H1" — for precision, internal, external, right and left hand threads . . . AUTOMATICALLY.

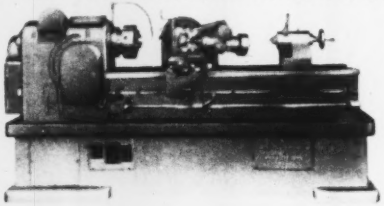
EXCLUSIVE ADVANTAGES:

- High speed drive to work spindle.
- New, wider range of speeds and feeds.
- High speeds for non-ferrous metals.
- Slow speeds for heat treated materials.
- Motors enclosed . . . easily accessible.
- Quick change over for short runs.

"L1" — for precision, square, standard and 29 degree threads. Internal or External . . . AUTOMATICALLY.

EXCLUSIVE ADVANTAGES:

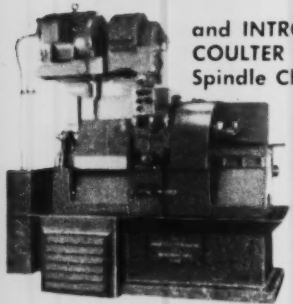
- Four speed headstock.
- Return or idle travel speed increased five times cutting speed.
- Disc clutch. Start and stop easily.
- Operator always has control.
- Individual adjustments to both front and rear tool slides.



"THREADMASTER" — for precision, long and short traversing, elevating, cross feed and lead screws . . . AUTOMATICALLY.

EXCLUSIVE ADVANTAGES:

- Cutter head design permits full size cutter spindle.
- Use a plain or anti-friction bearing spindle in same housing.
- Conventional or climb cutting possible.
- Wide range of speeds and feeds.
- Takes small or large diameter work.
- Full size spindle.
- Use high speed steel or carbide cutting tools . . . on any materials.



and INTRODUCING THE NEW COULTER "T5" . . . Single Spindle Chucking Machine.

Now, drill, ream and counter bore, face and form turn . . . automatically. Here are multiple operations in one chucking.

EXCLUSIVE ADVANTAGES:

- 3 times faster.
- No second operation needed.
- Use any materials, with carbide tools.

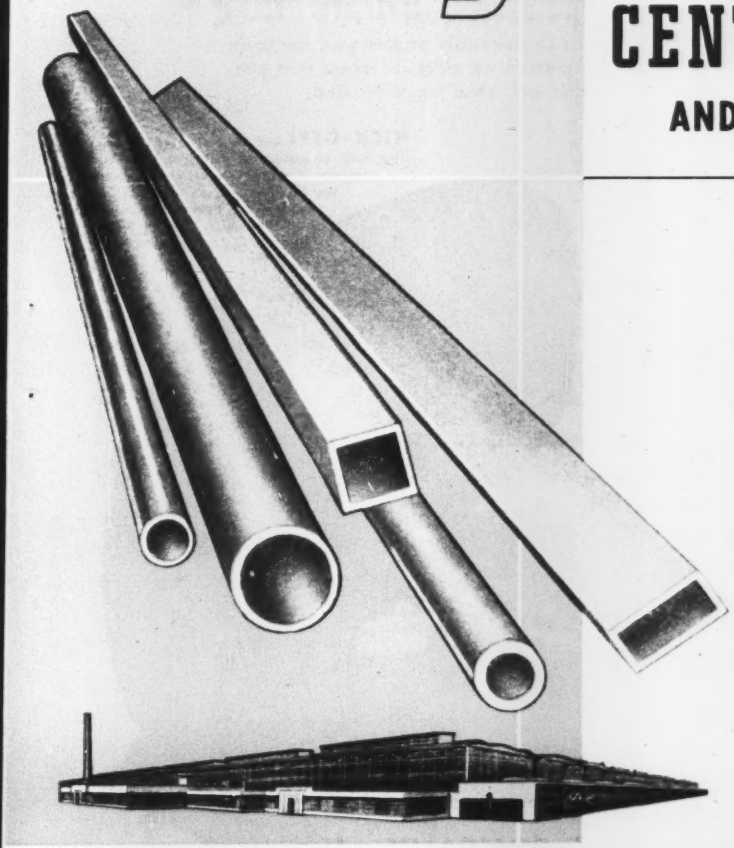
Write for complete information. Tell us your problems, our engineers can help you.

The James Coulter Machine Co. BRIDGEPORT, CONN.

tubing

...available at

CENTRAL STEEL
AND WIRE COMPANY



SEAMLESS STEEL
mechanical in complete size ranges

WELDED STEEL
(Flash-in and Flash-removed)
Round, square and rectangular

STAINLESS STEEL
seamless and welded tube and pipe

COPPER AND BRASS
tubing and water pipe in a complete range of tempers

ALUMINUM
tubing and pipe in a wide range of tempers and analyses

Hot Rolled • Cold Finished
Carbon & Alloy • Stainless
Copper • Brass • Aluminum
Expanded Metal • Structurals

Central Steel & Wire Company

CHICAGO 80, ILL.
P. O. Box 5310-A
REpublic 7-3000

DETROIT 12, MICH.
13400 Mt. Elliott Ave.
TWinbrook 2-3200

CINCINNATI 14, OHIO
Box 148 Annex Sta.
AVon 2230

MILWAUKEE 14, WIS.
6623 W. Mitchell St.
EVergreen 4-7400

What's the key to a winning team?

Teamwork, the coaches call it. Coordination.

Making steel is a complicated task in the best of time. And today we're really working under pressure—filling a backlog of orders, trying to make the kinds and qualities of steel you want and still fulfill military requirements and government allocations.

That's why coordination of departments is the No. 1 Rule here at Wisconsin Steel. It's more than just something to pay lip to. It's our way of life.

It enables us to make only promises we can keep, and keep any promises we make. It means that you can count on delivery, when you order steel.

KICK-OFF! And the ball soars far down the field, propelled by a husky tackle's 240 pounds of perfectly coordinated muscle. See how the player's foot digs into the ball at the moment of impact, in this A. G. Spalding & Bros. high-speed photo.

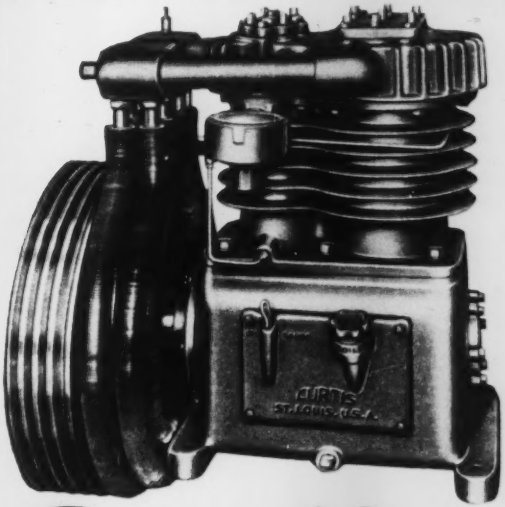
INTERNATIONAL HARVESTER

WISCONSIN STEEL COMPANY, affiliate of INTERNATIONAL HARVESTER COMPANY
180 North Michigan Avenue, Chicago 1, Illinois

WISCONSIN STEEL

MORE AIR Per Horse Power

- IT'S TWO-STAGE
- IT'S AIR COOLED
- SELF OILING



The New Curtis

MODEL 98 AIR COMPRESSOR

TWO-STAGE AIR COOLED 15 AND 20 HORSEPOWER

TWO-STAGE — More air per kilowatt hour, assuring savings in power bill.

AIR-COOLED — No expensive water bills; eliminates plumbing installation costs.

INTERCOOLER — Four section, finned, providing unusually effective cooling between stages; cooled by cyclone of air from fan flywheel.

SELF OILING — Simple, positive centro ring method; provides pressure lubrication of connecting rod and pistion pin bearings.

TWO TIMKEN MAIN BEARINGS — Tapered rollers; provide easy adjustment made externally without dismantling compressor.

VALVES — Readily removable as assembled units without removing cylinder head or breaking pipe connections or gasket joint.

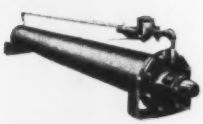
CRANKSHAFT — Counterbalanced, drop forged — two main bearings — no overhung bearing.

PRECISION WORKMANSHIP — Assures long life and minimum maintenance.

EXPERIENCE — Backed by 99 years of manufacturing — assures you dependable, troublefree service.

Available as a simple compressor or base mounted — motor driven.

LET ONE MAN DO THE WORK
with this Curtis air-operated equipment.



AIR CYLINDERS — for almost any pushing, pulling or hoisting operation.

AIR HOISTS — for low-cost lifting or lowering of materials or machines.

-728

CURTIS PNEUMATIC MACHINERY DIVISION
of Curtis Manufacturing Co.
1996 Kienlen Avenue, St. Louis 20, Mo.

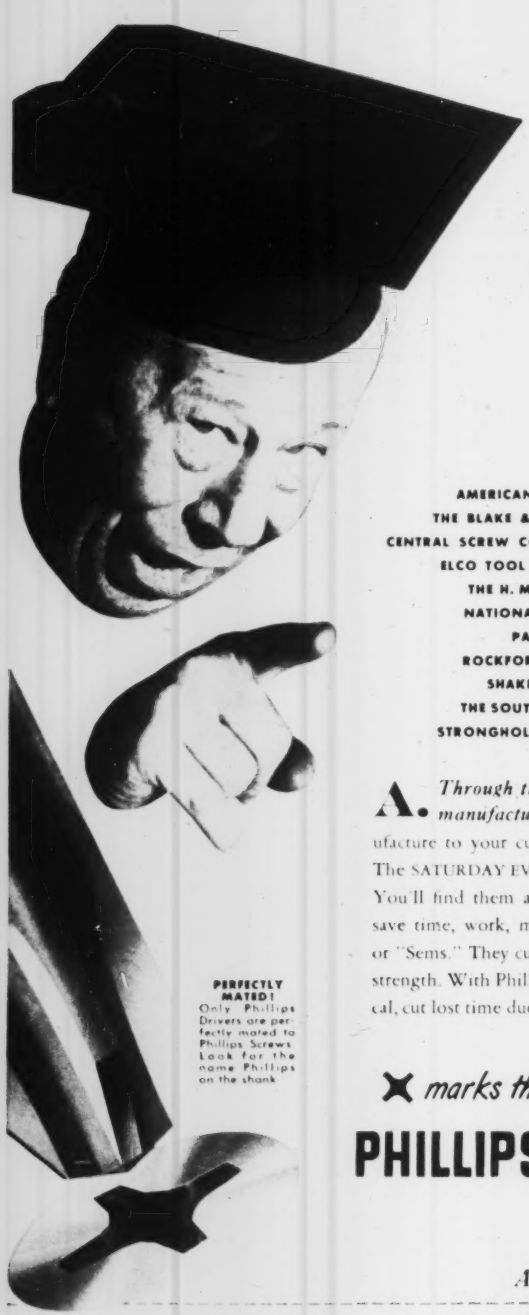
I am interested in items checked below:

☐ THE NEW MODEL 98 ☐ AIR HOISTS ☐ AIR CYLINDERS
☐ AIR COMPRESSOR

Name.....
Firm.....
Street.....
City.....Zone....State.....

CURTIS PNEUMATIC MACHINERY DIVISION of Curtis Manufacturing Company

1996 KIENLEN AVENUE ST. LOUIS 20, MO.



PERFECTLY MATED! Only Phillips Drivers are perfectly mated to Phillips Screws. Look for the name Phillips on the shank

Q. *How can they increase your sales?*

AMERICAN SCREW CO. · ATLANTIC SCREW WORKS, INC.
THE BLAKE & JOHNSON CO. · CAMCAR SCREW & MFG. CORP.
CENTRAL SCREW CO. · CONTINENTAL SCREW CO. · THE EAGLE LOCK CO.
ELCO TOOL AND SCREW CORP. · GREAT LAKES SCREW CORP.
THE H. M. HARPER CO. · THE LAMSON & SESSIONS CO.
NATIONAL LOCK CO. · THE NATIONAL SCREW & MFG. CO.
PARKER-KALON CORP. · PHEOLL MFG. CO.
ROCKFORD SCREW PRODUCTS CO. · SCOVILL MFG. CO.
SHAKEPROOF INC. · SOUTHERN SCREW COMPANY
THE SOUTHINGTON HDWE. MFG. CO. · STERLING BOLT CO.
STRONGHOLD SCREW PRODUCTS, INC. · WALES-BEECH CORP.

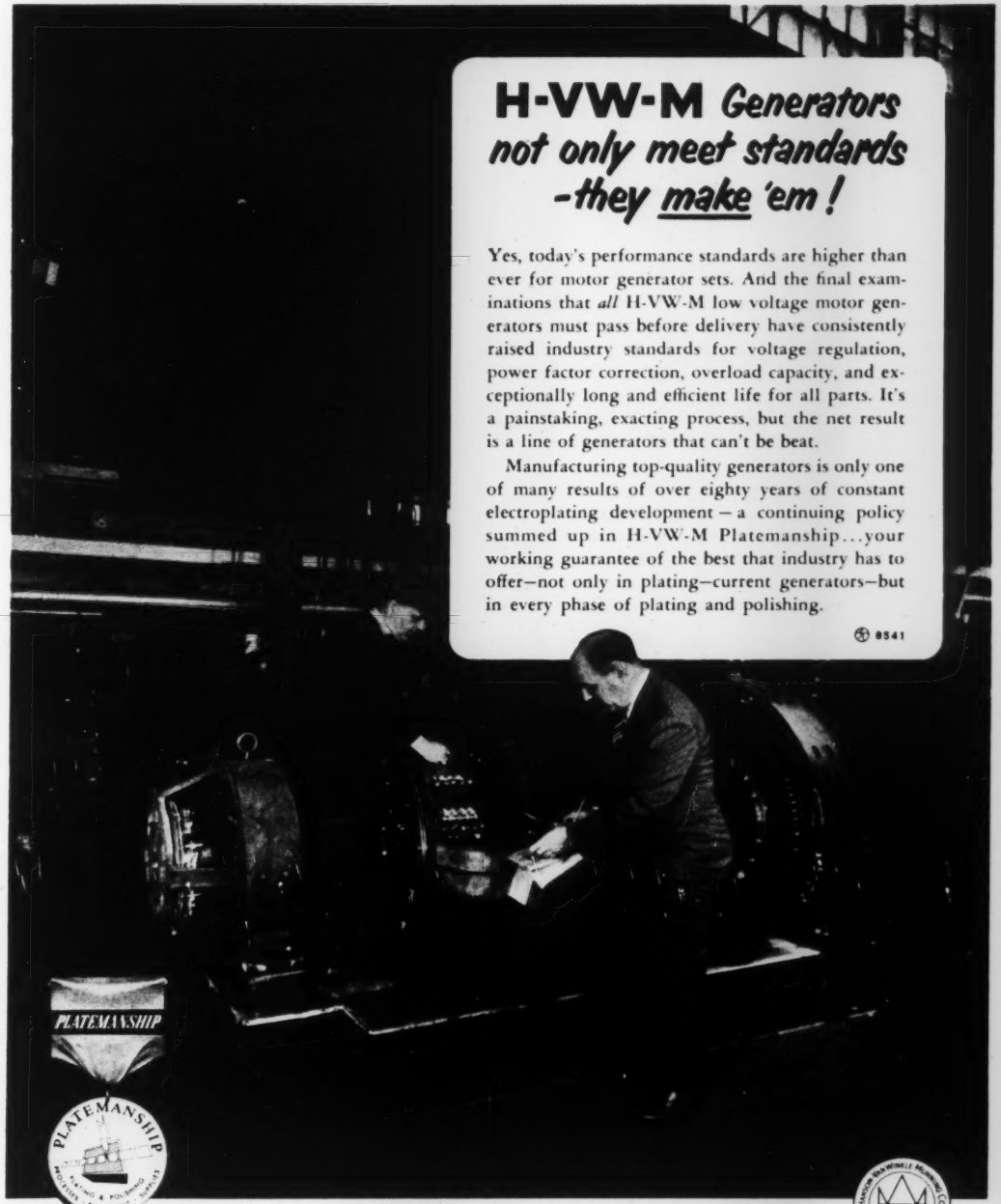
A. *Through the Phillips Cross-Recessed-Head Screws that they manufacture.* These famous fasteners are a mark of quality manufacture to your customers. Phillips Screws are nationally advertised in The SATURDAY EVENING POST as the clue to quality: X marks the spot. You'll find them a real sales-plus on your product. What's more, you save time, work, money with Phillips Wood, Machine, Tapping Screws or "Sems." They cut driving time up to 50%, set up tighter, add structural strength. With Phillips Screws you'll find production power driving practical, cut lost time due to accidents. Be sure to cash in on their many benefits.

X marks the spot... the mark of extra quality

PHILLIPS *Cross-Recessed-Head* **SCREWS**

As Advertised in The Saturday Evening POST

THE FASTENERS OF TODAY . . . AND OF THE FUTURE



H-VW-M *Generators not only meet standards -they make 'em!*

Yes, today's performance standards are higher than ever for motor generator sets. And the final examinations that *all* H-VW-M low voltage motor generators must pass before delivery have consistently raised industry standards for voltage regulation, power factor correction, overload capacity, and exceptionally long and efficient life for all parts. It's a painstaking, exacting process, but the net result is a line of generators that can't be beat.

Manufacturing top-quality generators is only one of many results of over eighty years of constant electroplating development – a continuing policy summed up in H-VW-M Platemanship...your working guarantee of the best that industry has to offer—not only in plating—current generators—but in every phase of plating and polishing.

8541

PLATEMANSHIP

PLATEMANSHIP

For full information on all H-VW-M Low-Voltage Generators, ask for Bulletin G-102.

Your H-VW-M combination—of the most modern testing and development laboratory—of over 80 years experience in every phase of plating and polishing—of a complete equipment, process and supply line for every need.

HANSON-VAN WINKLE-MUNNING CO., MATAWAN, N. J.
PLANTS AT MATAWAN, N. J. • ANDERSON, INDIANA
SALES OFFICES ANDERSON • BOSTON • CHICAGO • CLEVELAND
DAYTON • DETROIT • GRAND RAPIDS • MATAWAN • MILWAUKEE
NEW HAVEN • NEW YORK • PHILADELPHIA • PITTSBURGH
ROCHESTER • SPRINGFIELD (MASS.) • STRATFORD (CONN.) • UTICA

H-VW-M

INDUSTRY'S WORKSHOP FOR THE FINEST IN PLATING AND POLISHING PROCESSES • EQUIPMENT • SUPPLIES

Advertisement

ELECTROMET Data Sheet

A Digest of the Production, Properties, and Uses of Steels and Other Metals

Published by Electro Metallurgical Company, a Division of Union Carbide and Carbon Corporation, 30 East 42nd Street, New York 17, N. Y. • In Canada: Electro Metallurgical Company of Canada, Limited, Welland, Ontario

How SILICOMANGANESE Saves Furnace Time . . . Produces Better, Cleaner Steel

Silicomanganese is used by the steel industry as a furnace block* and deoxidizer and also for manganese additions.

The cleanness and quality of steel depend largely on how well it has been deoxidized. Deoxidation also greatly influences the physical properties of steel for rolling and subsequent fabrication. Silicomanganese combines two active deoxidizers in a single alloy and it has proved to be a more effective deoxidizer than silicon or manganese alloys added separately. This combination alloy contains silicon and manganese in the correct proportion (approximately 1 to 3.5) to be most effective in reducing the oxygen content of the bath to a low level. The use of silicomanganese produces cleaner steel, saves furnace time, and gives high alloy recovery for manganese additions.

Gets More Oxygen Out of Bath

When silicomanganese is used for blocking and deoxidation, the combined effect of silicon and manganese lowers the oxygen content to a greater degree than silicon alone. This is due to the fact that the amount of oxygen in equilibrium with a given amount of silicon is lower in iron-silicon-manganese alloys than it is in plain iron-silicon alloys, as shown in Fig. 1.

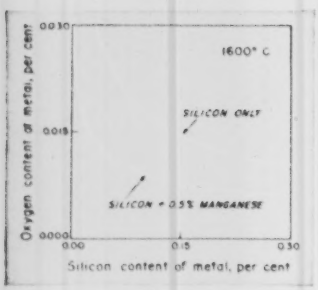


Fig. 1. Limit of solubility of oxygen in iron-silicon alloys, plain and with 0.50 per cent manganese at 1600° C.

*The initial deoxidation of steel, frequently referred to as the furnace block, stops the carbon-oxygen reaction in the furnace. This arrests the carbon drop immediately and makes it possible to secure close control of analysis. If the oxygen content of the metal is reduced well below the level established by the carbon-oxygen reaction, initial deoxidation is accomplished.

Less Inclusions, Cleaner Steel

In addition to lowering the oxygen content, silicomanganese has a specifically beneficial effect on inclusions. The inclusions in a steel depend in large part on how low the carbon content (or how high the oxygen content) is before blocking. The lower the carbon, the dirtier the final steel, almost regardless of the subsequent deoxidation treatment. Since silicomanganese has a low carbon content, it is not necessary to drive the carbon as low (or make the oxygen as high), as when high-carbon or standard ferromanganese is used, so that the final steel is cleaner and has better working properties. The improved cleanliness resulting from silicomanganese is usually noticeable in higher carbon steels, but is outstanding in steels below 0.25 per cent carbon where inclusions and surface defects are a vital problem and where the time saved by blocking at a higher carbon level is significant.

Fast Solubility In Bath

Because of the high concentration of active elements in silicomanganese, less time is required to effect solution of this alloy than when equivalent amounts of silicon and manganese are used separately in the form of ferrosilicon and ferromanganese.

For example, compare these typical analyses of silicomanganese, standard ferromanganese, and 50 per cent ferrosilicon:

	Silicomanganese, %	Standard Ferromanganese, %	50% Ferrosilicon, %
Manganese	66.5	80	—
Silicon	19	—	50
Carbon	1.5	7	—
Iron, approx	13	13	50

From this it can be seen that 1,000 lb. of silicomanganese would contain 190 lb. of silicon and 665 lb. of manganese. These amounts of silicon and manganese would require 380 lb. of 50 per cent ferrosilicon and 830 lb. of standard ferromanganese, or a total of 1,210 lb. Obviously it is easier and faster to dissolve 1,000 lb. of the combination alloy silicomanganese than 1,210 lb. of these separate silicon and manganese alloys.

Lower Carbon Content

Silicomanganese contains less carbon than any combination of ferrosilicon and standard ferromanganese. Therefore, the carbon-oxygen reaction in the bath can be stopped earlier when silicomanganese is used for blocking. Heats can be blocked at higher carbon levels and hence lower oxygen contents, and the amount of deoxidation required is less.

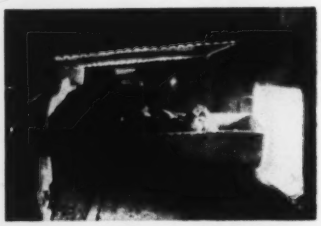


Fig. 2. Charging silicomanganese into an open-hearth furnace.

Saves Furnace Time

Because of the advantages outlined, silicomanganese can save as much as 20 minutes per melt in the production of open-hearth steel. For low-carbon steel, an even greater saving in time can be realized.

For Producing Engineering Steels

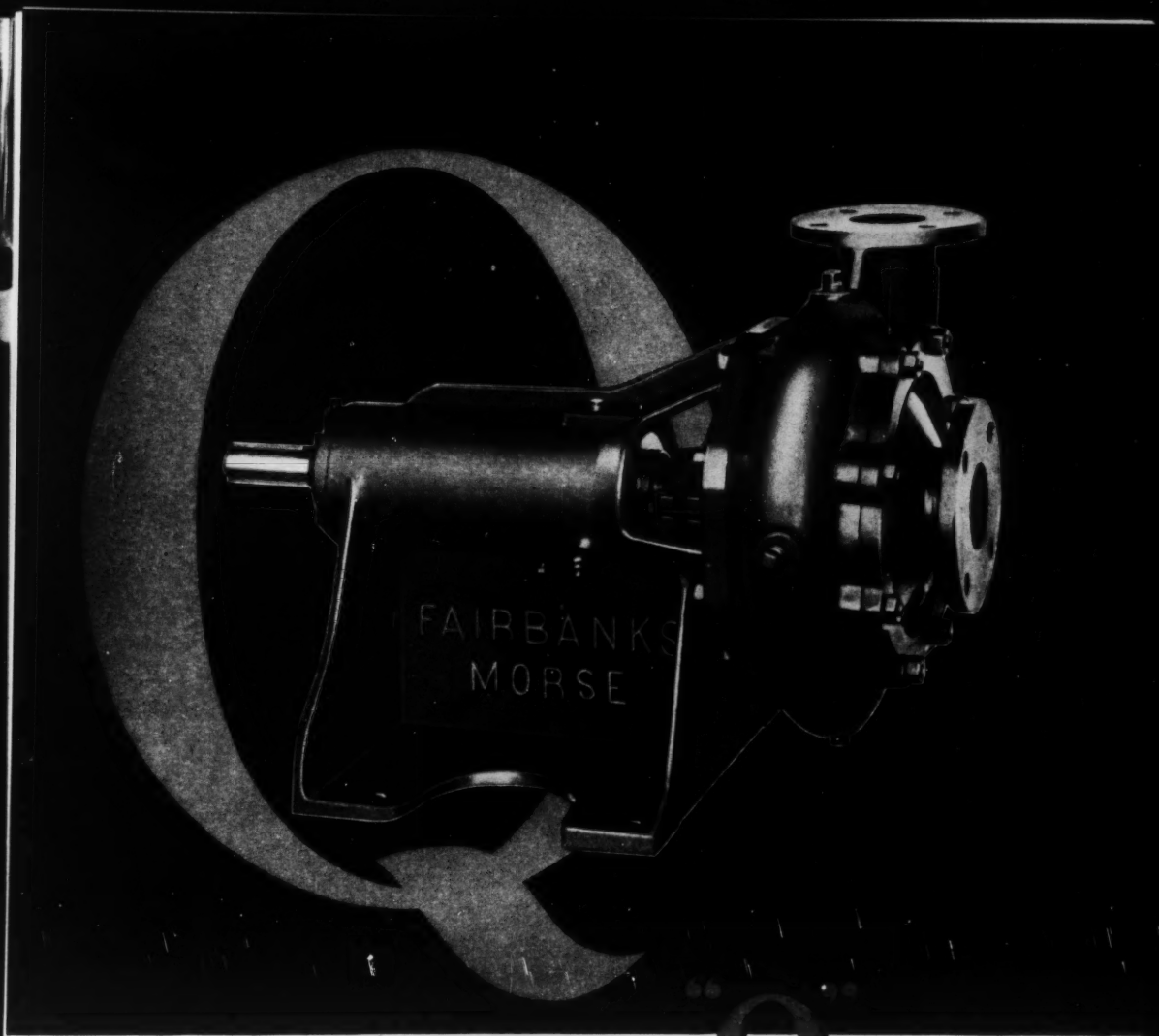
Silicomanganese is also used for alloy additions of manganese, particularly in the production of engineering steels containing 0.10 to 0.50 per cent carbon.

When manganese or other oxidizable additions, such as chromium, must be made to the bath, the use of a block provides a higher alloy recovery. Silicomanganese introduces manganese with the silicon and the usual recovery of this manganese will range from 70 to 85 per cent.

Metallurgical Service Available

Ask to have one of our metallurgists call and explain more fully the advantages of silicomanganese as a furnace block and deoxidizer. He will be glad to help you with the use of ELECTROMET silicomanganese. This alloy contains 65 to 68 per cent manganese and is produced in maximum 1.50, 2.00, and 3.00 per cent carbon grades. All grades are furnished in a lump size of 75 lb. x 2 in. and in a crushed size of 2 in. x down. Write, wire, or phone the nearest ELECTROMET office.

The word "Electromet" is a registered trademark of Union Carbide and Carbon Corporation.



it's Your Q

Quality . . . that costs no more is yours when you choose Fairbanks-Morse Side Suction Centrifugal Pumps. Extensive engineering laboratories . . . production line methods with precision machining of all parts enable Fairbanks-Morse to offer you a side suction centrifugal with the design, workmanship and performance normally obtained only in highest quality split-case pumps.

Open type, single suction, high efficiency impeller . . . ball-bearing frame construction for long life and smooth operation . . . one-piece, solid cast frame . . . close-grained smooth cast iron volute . . . are among the many big pump features you'll find in these moderate priced side suction centrifugals.

For a "cue" to better pump performance, choose the pumps that spell quality with a capital "Q" . . . Fairbanks-Morse Side Suction Centrifugals. Fairbanks, Morse & Co., 600 S. Michigan, Chicago 5, Ill.

FAIRBANKS-MORSE,

a name worth remembering when you want the best

PUMPS • DIESEL LOCOMOTIVES • ELECTRICAL MACHINERY • SCALES • HOME WATER SERVICE EQUIPMENT • RAIL CARS • FARM MACHINERY • MAGNETOS

Here's the Big Difference!

TAPER-LOCK

–The Sheave that always runs true!

The Taper-Lock bushing seats evenly along the entire length of the hub. It is self-seating. There is no collar—no protruding part—no flange to prevent uniform compression.

With full contact, Taper-Lock sheaves run true. Made of finest grade of close-grained semi-steel, cast in the Dodge foundry. Precision grooves have identical pitch diameters so that every belt can pull its share of the load.

Sheave and bushing mount as a unit—easy to align on the shaft. Grips the shaft like a shrunk-on fit. Flush hub means safety.

THERE IS ONLY ONE TAPER-LOCK (a patented product of Dodge). Available from distributors' stocks in a complete range of sizes in A-B combination, B, C and D grooves. Also ask your distributors for Dodge Sealed-Life V-Belts. WRITE for complete data.

DODGE MANUFACTURING CORPORATION, 4400 Union St., Mishawaka, Indiana

DODGE

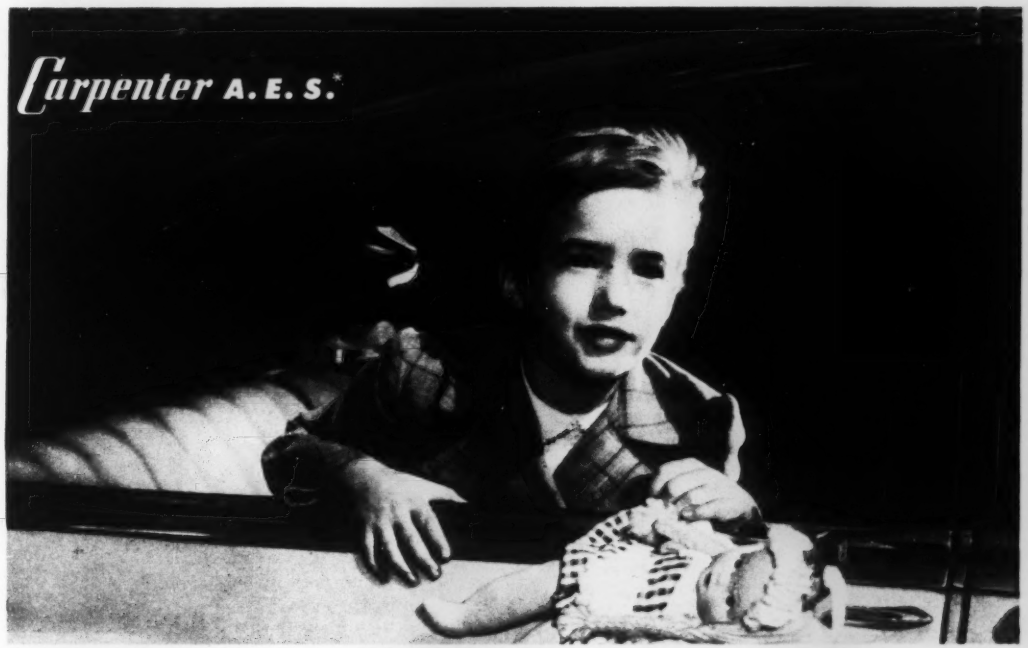
of Mishawaka, Ind.

CALL THE TRANSMISSIONEER

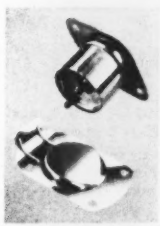
your local Dodge Distributor. Factory trained by Dodge, he can give you valuable assistance on new, cost-saving methods. Look for his name under "Power Transmission Machinery" in your classified phone book.

NAME PLATES

FOR YOUR NAME PLATE REQUIREMENTS, WRITE OUR SUBSIDIARY, CHICAGO THRIFT-ETCHING CORPORATION, 1555 SHEFFIELD AVENUE, CHICAGO 22, ILLINOIS



Life Saver for Small Fry



*Another example of how Carpenter *Application Engineering Service is working for industry*

You know how youngsters are on a trip—they love to be near the window to make sure they see everything whizzing by. But that can be dangerous . . . a door can fly open, a tragedy can strike. That's why this safety door lock was invented. Quickly attached, it keeps children in . . . enables them to enjoy the trip, safe and secure. To open the door, the driver simply pulls a release knob. But the production problem wasn't as simple as that.

The material for the lock had to be economical to fabricate, had to provide high strength, corrosion resistance and a bright finish. Cold rolled steel, chrome plated, was tried but it just couldn't make the grade.

Then Carpenter was called in and Application Engineering Service went to work. Results: They used Stainless No. 6 (Type 430), a bright, high-strength, easy-working Stainless produced by Carpenter for just such jobs. No. 6 met all the requirements . . . and made the lock a real sales winner.

Here is another example of how Carpenter A.E.S. is working with industry to unearth new ways to make products more functional, more salesworthy, more economical to produce. You can count on this Carpenter service to help bring these advantages to your plant, too. It goes to work as soon as you get in touch with your Carpenter Mill-Branch Warehouse or Distributor. THE CARPENTER STEEL CO., 139 W. Bern St., Reading, Pa.

Carpenter STEEL

Tool, Alloy and Stainless Steels

Pioneering in Improved Tool, Alloy and Stainless Steels Through Continuing Research

instantaneous control

Only P&H AC Welders have this feature

for faster, easier, sounder welds on non-ferrous and "hard-to-weld" metals

No other welder has this Instantaneous Control feature. Foot-operated, the control provides the heat you call for instantly, *electrically* — not mechanically. No time lag. It's a P&H exclusive that boosts production, cuts costs, saves time.

Inert Gas Welding

Instantaneous control lets you handle "hard-to-weld" metals with ease — aluminum, magnesium, brass, copper, stainless, high carbon, high alloy, and low carbon steels. You get sound welds — X-ray quality every time. No burn throughs, fewer rejections.

Operators like it, too. It gives them faster, better welds in only five simple steps. Check them:

1. Foot switch automatically turns on power, high frequency, water and gas.
2. Arc starts *instantly* without touching work.
3. Foot switch control provides exact heat needed *while* welding — *no time lag.*
4. Foot-operated control cuts power either gradually or instantly at completion of weld. Eliminates craters — no scrap pieces needed to run out bead.
5. Gas and water shut off automatically according to pre-set time delay.

Compare AC Inert Gas Welders, point by point, and you'll buy P&H. Check these outstanding features:

- **P&H Dial-lectric Control** — No moving coils or cores to bind or freeze. Maintenance is absolutely negligible.
- **Built-in high frequency unit** — eliminates additional external equipment. Variable frequency control.
- **Automatic gas and water control** — Pre-set automatic time delay control (2 seconds to 2 minutes) prevents electrode contamination, assures clean, sound welds.
- **Stepless amperage regulation** — from 10 amps to maximum. Three models available — ranges 200, 300 and 500 amps.
- **Unusual arc stability** — Makes good clean welds where extremely low amperages are required.
- **Selector switch** — gives operator instant choice of standard or high frequency unit.

No wonder P&H Inert Gas Welders are the choice of the aircraft industries where top quality work and speed are "musts". They join "hard-to-weld" metals faster and easier — eliminate rejects for you, too. Get full details from your P&H representative or write us for further information.

2426

P&H
WELDING DIVISION
HARNISCHFEGER CORPORATION
4411 WEST NATIONAL AVE. • MILWAUKEE 14, WISCONSIN

POWER SHOVELS • CRAWLER AND TRUCK CRANES • OVERHEAD CRANES • HOISTS • ARC WELDERS AND ELECTRODES • SOIL STABILIZERS • DIESEL ENGINES • PRE-FABRICATED HOMES

Here at Sterling Bolt Co., a single, integrated DEPENDABLE source can supply you with more than **200,000** stock and standard sizes in Bolts, Nuts, Screws and Washers for your specific needs.

For more than 35 years Sterling Bolt has been a prime supplier of metal fastenings to America's best-known companies—because Sterling facilities combine both warehouse and mill, giving you advantages of **PROMPT SERVICE** and **COMPETITIVE DISCOUNTS.**

try these for SIZE

THE INDUSTRIES WE SERVE—AND SERVE WELL!

Refrigeration • Pumps • Cranes • Elevators • Tractors • Trailers • Conveyors • Mining Equipment • Blower & Fan Equipment • Diesel Engines • Bodies—Motor Truck & Trailer • Electrical Manufacturing • Air Conditioning • Material Handling Equipment • Machinery Manufacturing • Radio & Television • and many others—

Interested in Cutting Costs?

No need to count on expensive, time-consuming specials when Sterling Bolt Standardized Bolts, Nuts and Screws can fit your job—200,000 to one!

Send your inquiry or order TODAY—to the

STERLING BOLT co.

401 West Erie Street, Chicago 10, Ill.

Telephone: SUperior 7-3000 • Teletype:CG 488

Offices: Cincinnati, Indianapolis, Milwaukee, St. Louis

Manufacturing Plants in Chicago, Milwaukee, St. Louis

Rock Island

A CENTURY OF SERVICE

52 Rock Island Lines 1952

100 years young...and building for the future with the American DiesELectric

Here at Silvis, Illinois, in 1952, the Rock Island lines took another step toward smoother, faster operation in its second century of operation. The old bridge had outlived its usefulness and had to be removed to straighten a curve. So an American Diesel Electric locomotive crane rolled in . . . the bridge was dismantled in 20 ton sections . . . and without any traffic delays the job was done.

The Rock Island, like every other progressive railroad, knows well the dollars and cents advantages of the *modernized* locomotive crane. That's why they take care of heavy construction and materials handling with the American DiesELectric. This ultra-modern locomotive crane, with diesel power to the deck, electric power to the trucks, gives them instant starts . . . one man operation . . . uninterrupted work days . . . marvelous smoothness, and tremendous power.

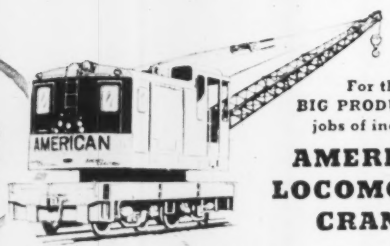
If it's time for a change in your equipment, choose an American . . . Diesel and DiesELectric types capacities from 25 to 80 tons.

Modernize...economize...with

American Hoist

& Derrick Company

ST. PAUL 1, MINNESOTA



For the
BIG PRODUCTION
jobs of industry...

AMERICAN LOCOMOTIVE CRANES

Another symbol of freedom

FEW inventions have contributed more to the freedom of our everyday lives than the familiar "tin can."

It has freed women from kitchen chores, thus broadening their activities.

It has freed us from a monotonous diet by permitting us to enjoy whatever foods we desire, in season or out.

It has freed the farmer from surplus losses by preserving his crops and permitting their sale throughout the year.

It has freed our armed forces to operate anywhere throughout the globe, supported by easily portable and nutritious food.

In countless ways, the versatile can is an essential part of convenient, modern living—thanks to the continuing research and ingenuity of can manufacturers and the canning industry.

Kaiser Steel is proud to serve this great industry . . . through the production of urgently needed tin plate at its new mill in Fontana.

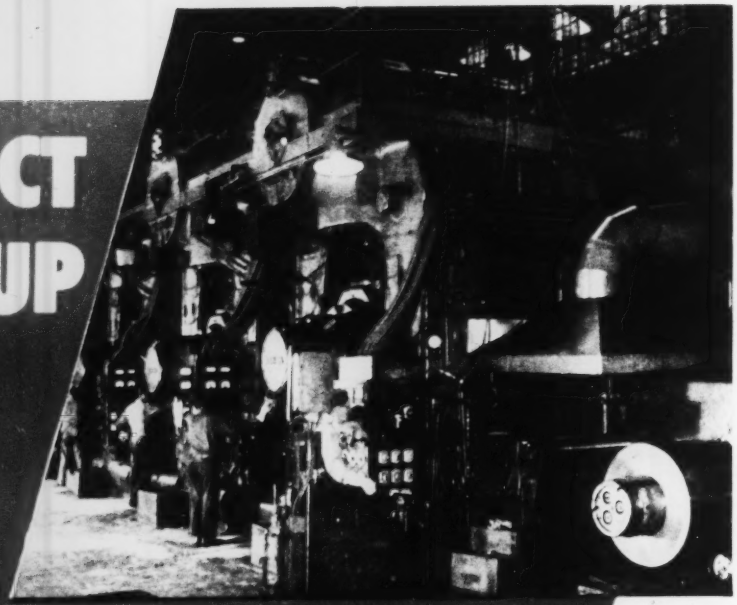
It's good business to do business with

Kaiser Steel

built to serve the West

PROMPT, DEPENDABLE DELIVERY AT COMPETITIVE PRICES • plates • continuous weld pipe • electric weld pipe • tin plate • hot rolled strip • hot rolled sheet alloy bars • carbon bars • structural shapes • cold rolled strip • special bar sections • semi-finished steels • pig iron • coke oven by-products
For details and specifications, write: **KAISER STEEL CORPORATION, LOS ANGELES, OAKLAND, SEATTLE, PORTLAND, HOUSTON, TULSA, NEW YORK**

PROTECT BACK-UP ROLL NECKS



lubricate oil film bearings with TEXACO REGAL OIL

When you have *Texaco Regal Oil* in the circulating system, your back-up roll necks get the best possible protection against heavy loads and high temperatures. You get trouble-free performance, longer bearing life, lower maintenance costs.

Texaco Regal Oil is turbine quality oil that resists oxidation and sludging . . . keeps oil lines and bearings clean for uninterrupted flow of a clean, cooling lubricant. There is a complete line of *Texaco Regal Oils* to meet your exact requirements.

In your enclosed reduction gears, use *Texaco Meropa Lubricant*. It has outstanding "extreme pressure" properties, plus high resistance to oxidation, thickening and foaming . . . assures longer gear and bearing life, lower maintenance costs. For similar results on open gears, use *Texaco Crater*.

A Texaco Lubrication Engineer will gladly help you run all your machinery more efficiently. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write:

The Texas Company, 135 East 42nd Street, New York 17, N. Y.

TEXACO Regal Oils

(HEAVY CIRCULATING OILS)

Fruitful years 50 for Fifty Years

TUNE IN On television the TEXACO STAR THEATER starring MILTON BERLE. See newspaper for time and station.

The Metalworking Outlook

November 3, 1952

More Steel, but CMP Continues

As predicted here, NPA will go ahead with CMP programming for the second quarter. Deadline is Dec. 1 on the 11,000 form 4b's that industry must file for tickets for April, May and June. CMP will remain in force at least until next June 30, although the steel supply situation is improving steadily. Latest indication of that: Extra tickets for nearly 1.5 million tons of some steel products will be issued for the first quarter (p. 169). Automakers will get some of that, but by no means all.

Fairless Works: 72% Finished

U.S. Steel Corp.'s Fairless Works is now about three months behind construction schedules; it's 72 per cent completed and will be turning out pig iron in December, finished steel in late December or the first quarter. The whole facility should be finished by mid-1953. Some flat-rolled products will be made from Pittsburgh ingots to break in mills. Venezuelan ore is scheduled for use by early 1954.

Venezuela Wants Steel

Venezuela has approached U.S. Steel on building steel facilities in the South American country. The corporation has agreed to give assistance on a continuing basis. European steel companies and engineering firms have also been approached.

New Worry in Coal

The coal work stoppages caused barely a flicker in metalworking production, and now that most of the miners are back on the job no problems of shortages in bituminous appear imminent. Odds favor an eventual peaceful settlement of the coal-WSB dispute. Although you have little to worry about over coal supplies, there is plenty to disturb you about coal prices. If the $1.90-a-day increase to miners is finally approved, it will mean $1-a-ton more in finished steel costs.

How Much Mechanization?

How far can industry go in mechanization and automaticity before labor begins loud protests? Thus far, organized labor generally has not hindered mechanization unduly in America. The subject was one of many considered at Westinghouse Electric Corp.'s Materials Handling Conference in Buffalo last week. Consensus: There's still some leeway, but the time is approaching when louder protests from unions can be expected. Tom Turner, manager of the Westinghouse Buffalo Division, says that another limit to full automaticity is imposed by the inflexibility of such systems.

Until Mid-November

No major defense mobilization decisions will be made until mid-November at the earliest. The impact of the election results won't

Production Engineering News, p. 91 ... The Market Outlook, p. 169

be fully appraised until then. What's more, Defense Mobilization Boss Henry H. Fowler is off on a two-week trip to Europe to study conditions in NATO countries. Out of that trip may come new decisions to build more American equipment for Europe.

Industrial Gas Use Soars

More than 50,000 industrial plants now use natural gas, double the number in 1941 (p. 74). Speakers at the American Gas Association meeting last week predict that future increases in the use of natural gas will come in heat-treating, chemical production, industrial and residential space heating and cooking. Industrial consumption of natural gas by 1975 is estimated at 8.8 trillion cubic feet, slightly more than half the total consumption at that time.

On Construction Machinery

In 1952 you can expect total production of cranes and shovels to reach $450 million . . . Output of tractors and allied equipment should amount to $750 million this year . . . Some 50,000 track-type tractors will be turned out, 10,000 below original estimates because of the steel strike . . . Crane and shovel production, originally expected to hit 14,000 units in 1952, probably won't quite reach that total, again because of the steel strike.

Straws in the Wind

The American Welding Society will hold a meeting and show at the Shamrock Hotel in Houston June 16-19, next year . . . Supervisors at the strike-bound Detroit Edison Co. are able to keep abreast of developments in the strike by calling a secret telephone number; a tape recording, kept up to the minute, gives the information . . . Youngstown Sheet & Tube Co. will build a new 76-oven by-products coke battery at its Campbell Works. The addition will have a rated capacity of 450,000 tons a year . . . UAW-CIO representatives are calling for some 15 changes in their agreement with Chrysler, attack an alleged "speed-up" in work in the company's plants.

What Industry Is Doing

Office of Price Stabilization is flooded with price-hike requests from metalworking companies (p. 63) . . . Expansion costs are soaring 20 to 40 per cent over estimates at the Indiana Harbor Works of Youngstown Sheet & Tube Co. (p. 64) . . . Defense Production Administration is showing more caution in expansion programs (p. 65) . . . Construction activity is bulldozing to a new high of $32 billion in 1952, and the drop isn't expected until after 1953 (p. 66) . . . The gas industry's $1 billion-a-year expansion means more fuel and new markets for metalworking companies (p. 74).

These huge natural gas engines, about 40 to a room, drive the generators furnishing all the electricity used by Alcoa to produce [illegible] pounds of aluminum at this plant yearly.

800 BOXCARS OF AIR

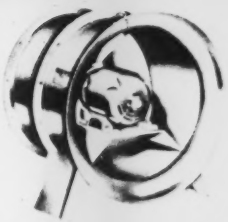
KEEP GENERATORS AT PEAK EFFICIENCY

Down at Point Comfort, Texas, a new kind of power plant was built a few years ago. 120 engines, running on natural gas, drive huge electric generators. Their job: to supply the current to smelt defense-needed aluminum. One of the biggest problems, though, was to keep the equipment running cool and thus at top efficiency.

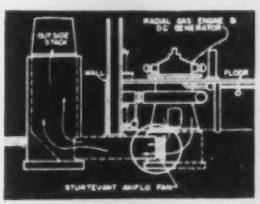
120 Westinghouse Axiflo® fans did the trick. Each draws 12,000 cubic feet of air through the generators every minute, picking up the excess heat. Then the air is piped through concrete ducts and out exhaust stacks which line both sides of the building.

Now Alcoa has just expanded this power plant. They have installed 24 new engines and Westinghouse has supplied 24 more Axiflos. All in all, the 144 fans will move over 2 billion cubic feet of cooling air through the generators every minute. That's enough air to fill a train load of 800 boxcars!

One day—today or in the near future—you may have a problem that involves *putting air to work*. When you do, remember that Westinghouse has the most complete air conditioning, air cleaning and air handling line in the industry. See the new Catalog 600. It contains 60 fact-filled pages on products, uses, and helpful data. To get your free copy, just call your local Westinghouse Sturtevant office, OR write to Westinghouse Electric Corporation, Sturtevant Division, Hyde Park, Boston 36, Mass.



Axiflo fans keep this power plant cool. They're compact, efficient, and trouble free. Heat is removed by hard-to-get-at sides.



Cooling air is drawn in through the ceiling, is conditioned by the fan, is forced down through the floor, is collected in ducts, and is exhausted through stacks.

YOU CAN BE SURE... IF IT'S Westinghouse

AIR HANDLING

TUNE IN ON HISTORY! [illegible]

Blow-torch heat doesn't "faze" this metal

The unique heat resisting qualities of Armco ALUMINIZED® Steel are demonstrated in the test pictured here. Two sample sheets of steel, one Armco ALUMINIZED and the other a standard cold rolled grade, were mounted side by side and subjected to *blow torch heat.*

The ordinary steel soon scaled and pitted, but the ALUMINIZED Steel was not damaged at the end of the test.

Not only does ALUMINIZED resist damage from heat — it also reflects heat up to 900 F. About 80% of the radiant heat sent against its surface *bounces back.*

If your products are exposed to a combination of heat and corrosion, you can give them extra sales advantages by using Armco ALUMINIZED Steel. The "give and take" qualities of this special hot dip aluminum coated steel make it ideal for many applications.

Write us for complete data on ALUMINIZED Steel.

ARMCO STEEL CORPORATION

4551 CURTIS STREET, MIDDLETOWN, OHIO • PLANTS AND SALES OFFICES FROM COAST TO COAST • EXPORT: THE ARMCO INTERNATIONAL CORPORATION

ARMCO

Never Again!

Sometime late tonight the terrible din of campaign orators will cease. Tomorrow we will go to the voting booths to select a President. After the results of the election are known, probably late Tuesday or early Wednesday, many of us will be so disgusted in spite of the victor that we may forget the strange series of events which preceded election day.

This would be a pity. We will do well right now to consider candidly some of the disagreeable aspects of the 1962 election campaign. In the first place, the conventions of the major parties can be improved in many ways. The artificiality of much of the pomp and ceremony is distasteful. There must be a way to conduct conventions on a higher plane.

Secondly, the election campaign in 1962 was futile in many respects. There is no sense in requiring the nominees to go through two long months of intensive campaigning. Would it not be better to restrict active electioneering to a period of a few weeks?

Thirdly, much of the debate during the past two months has been more confusing than it has been enlightening. We have heard more about the types of persons with whom the nominees are alleged to be associated than about the major issues. Too often campaign speeches have failed to help the voter to make up his mind about how to vote.

Finally, is it necessary for a President of the United States to demean his exalted office by engaging in political mud slinging of the lowest order?

After considering these and other discouraging aspects of the recent campaign, haven't we a right to ask ourselves whether or not there is a better way in which to select a President of the United States? Executives of metalworking companies have a voice in the activities of both major political parties. They should be among the first to recognize the faults of the campaign just ending.

Regardless of how the election comes out, let us resolve now that never again will we be passive parties to a campaign as soiseless and as confusing as that we have just witnessed.

GAS AND METALWORKING: Fifty years ago a company desiring to burn cheap natural gas was forced to locate its plant near a gas producing field. Transportation by pipeline was limited to a few miles. That is why large glass factories of the turn of the century constantly were moving from one spot to another in Western New York and Pennsylvania.

TREND IN TOOL DESIGN: Apparent at the Machine Tool Exhibition held in Olympia Hall in London was truly international in character as well as in name. More than 1300 machine tools were shown by builders from England, Belgium, Germany, Italy, Switzerland, France, Denmark, the Netherlands and the United States.

One competent visitor commented (p. 73) upon national characteristics of the exhibits. American builders excelled in high production equipment and special machines for manufacturing jet engine components. British equipment was notable for simple design in standard machine tools. Swiss exhibits were marked by accurate and superbly finished jig borers and measuring machines. Germans went all out on electronic controls. Particularly noticeable was the almost universal use of copying attachments. Increased rigidity and higher spindle speeds reflected the influence of carbide tooling.

NO SLUMP IN SIGHT: As one travels about the country and sees the impressive volume of work under construction, he instinctively asks himself: "How long can this go on? Haven't we passed the peak in construction activity?"

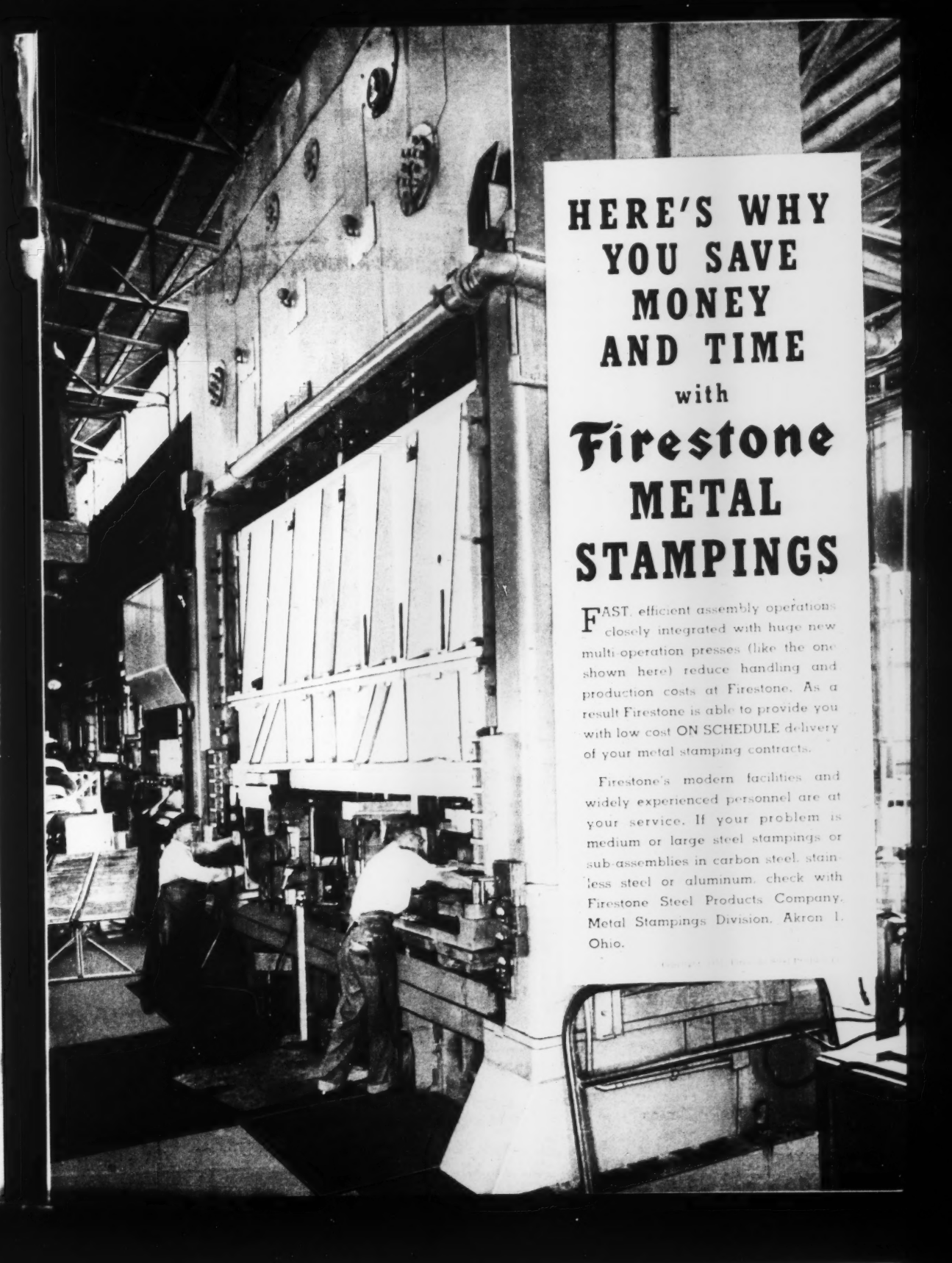
According to experts (p. 66) the end is not yet in sight. Expenditures for new construction in 1951 totaled $31 billion. Today it looks as if the figure for 1952 will be $32 billion. Those who have been trying to estimate the volume for 1953 conclude that it will equal or exceed that of 1952. They figure that industrial building will be off slightly; that residential construction, which has topped a million starts for three consecutive years, may drop to 900,000; that this decline will be more than offset by public housing; that expenditures for public roads will be up moderately; and that construction incidental to military requirements will require about $2.3 billion of work. The outlook is encouraging.

ULTRASONIC CLEANING: Early experience with the ultrasonic method of cleaning indicates that it has special promise in the field of small parts manufacture. Ultrasonic cleaning is being employed on shaver heads by Schick, Inc., on small precision-wound rotary slide wire potentiometers by Fairchild Camera & Instrument Corp. and on refrigerator unit parts by General Electric Co.

Cleaning is effected (p. 92) by foaming a high frequency sound wave through the cleaning solvent or detergent solution to the surface of the submerged workpiece. The wave is set up directly in the liquid cleaning bath by means of a quartz crystal which is driven by an electronic oscillator. Over-all cost of final cleaning in some cases is 50 per cent lower than that of conventional methods. Ultrasonic cleaning seems to be particularly well adapted to small parts of irregular shape where a positively clean surface is desired.

ONE EVERY 13 SECONDS: A large electrically operated map and scoreboard set up in the lobby of the Department of Commerce building in Washington affords visitors a quick and easy size-up of the nation's growth in population. Flashing lights indicate that in the United States a birth occurs every nine seconds, a death takes place every 21 seconds, an immigrant enters the country every two minutes and an emigrant departs for other countries every 17 minutes. The pluses and minuses add up to a net gain of one person in our population every 13 seconds.

This means that in a month's time the gain is roughly equivalent to the population of a city such as Worcester, Mass. Our knowledge of what the people of a city of this size require in the way of capital goods, materials, equipment, supplies and services should convince us that population growth alone still is an important factor in our economy.



HERE'S WHY YOU SAVE MONEY AND TIME with Firestone METAL STAMPINGS

FAST, efficient assembly operations closely integrated with huge new multi-operation presses (like the one shown here) reduce handling and production costs at Firestone. As a result Firestone is able to provide you with low cost ON SCHEDULE delivery of your metal stamping contracts.

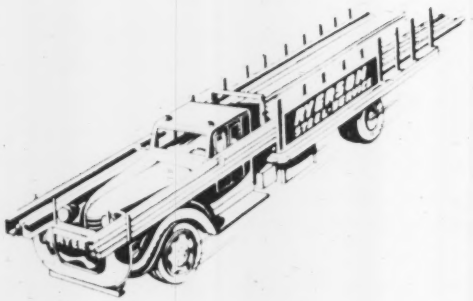
Firestone's modern facilities and widely experienced personnel are at your service. If your problem is medium or large steel stampings or sub-assemblies in carbon steel, stainless steel or aluminum, check with Firestone Steel Products Company, Metal Stampings Division, Akron 1, Ohio.

RYERSON

Ryerson Steel Service awaits your call at fifteen great plants, strategically located for quick delivery anywhere.

STEEL

Carbon, alloy, stainless—every kind of steel is on hand. Though some sizes are still occasionally out of stock, most requirements are usually available.



SERVICE

Ryerson representatives are ready to assist you on any problem involving the purchase, fabrication or application of steel. Just call your nearest Ryerson plant.

PRINCIPAL PRODUCTS

CARBON STEEL BARS—Hot rolled and cold finished.

STRUCTURALS—Channels, angles, I beams, etc.

PLATES—Many types including Inland 4-Way Safety Plate.

SHEETS—Hot and cold rolled, many types and coatings.

TUBING—Seamless and welded, mechanical and boiler tubes.

ALLOYS—Hot rolled, cold finished, heat treated. Also tool steel.

STAINLESS—Allegheny bars, plates, sheets, tubes, etc.

BABBITT—Five types, also Ryertex plastic bearings.

MACHINERY & TOOLS—For metal fabrication.

RYERSON CERTIFIED STEELS

JOSEPH T. RYERSON & SON, INC. PLANTS AT NEW YORK • BOSTON • PHILADELPHIA • CINCINNATI • CLEVELAND • DETROIT PITTSBURGH • BUFFALO • CHICAGO • MILWAUKEE • ST. LOUIS • LOS ANGELES • SAN FRANCISCO • SPOKANE • SEATTLE

Line Forms for Price Relief

Many industries pinched by wage and other cost hikes flock to OPS in increasing numbers for price adjustments under industry earnings standards

IT'S getting harder to make a buck, many metalworking industries find.

This is driving them in increasing numbers to the Office of Price Stabilization, Washington, in quest of relief in pricing.

A good many requests growing out of inflationary effects of defense business were being received before the steel wage settlement, but that settlement has really touched off a flood of pleas from industries that follow the steel industry pattern, especially since formulas worked out since the steel strike almost automatically permit the pass-through of cost increases in freight and in pig iron, steel, copper and aluminum, but not in wages or other materials.

Who Is Eligible — Industries which cannot obtain price ceilings that will give them a fair return even after using the pass-through formula are entitled to adjustments under the OPS industry earnings standard.

The standard provides that when earnings of an industry fall below 85 per cent of the earnings before federal taxes, based on net worth, in the best three out of four years from 1936 to 1949, it may obtain ceilings sufficiently higher to bring its earnings up to that level.

The Way It Works—The procedure to try to get a price increase via the industry earnings standard takes about six or seven weeks. The best manner to go about winning higher prices is to ask the industry advisory committee representing your segment of metalworking to request OPS for an industry survey. Don't waste time trying to get an out-and-out increase as the steel industry did. OPS has taken what looks like a firm stand that all increases henceforth will come only via the earnings criteria.

When OPS gets a request, it sends letters to selected companies in your industry and asks for audited profit and loss and balance sheets for 1946 through 1949 and for the latest complete annual accounting period, plus information on material and labor cost increases from the beginning of the latest complete accounting period to date. The agency then takes all that data and determines if your industry is below the 85 per cent minimum. If so, you get price increases to make up the difference. The refractory industry, for example, won a 5 per cent hike.

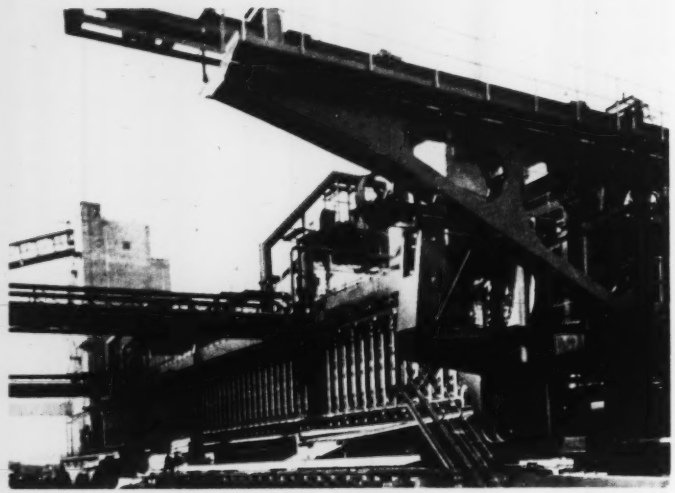
Rescued — Ten industries have been granted upward adjustments under the OPS industry earnings standard. They are: Food retailers, fruit manufacturers, ferromanganese producers, semi-vitreous and vitreous dinnerware manufacturers, coal briquet producers, at lake coal docks, refractories producers, agricultural and hand tool manufacturers, retail coal dealers, asbestos cement products manufacturers, and private brand drug manufacturers.

Losers—Adjustments sought by brass mills, motorized fire apparatus makers and galvanized ware manufacturers were discouraged.

Under Study—Surveys to determine whether industries are eligible for adjustments have been instituted for producers of: Crown closures; rolled figured heat absorbing and wire glass; sheet window glass; insulating siding; metal caps and home canning closures; cast iron boilers and radiators; enameled cast iron plumbing fixtures; metal cans; malleable iron castings; carbon and low alloy steel castings; steel shipping barrels, packages, kegs and pails; gray iron castings; high alloy steel castings; ferrochrome; cotton ginning machinery; industrial scales and balances; electrically operated underground coal mining machinery; aluminum cooking utensils; bicycles; processed soybeans; and hotel meat supplies.

Possibilities — Among industries for which industry earnings stand-

and surveys are being considered by OPS for: Air conditioning refrigeration equipment, automotive lifts, aluminum castings, aluminum mill products, asphalt and tarred roofing products, blast furnace slag, bolts and nuts, cast brass plumbing fixtures, coal chemicals, coke and coke oven gas, cement, clay sewer pipe, concrete products, convector radiators, copper-aluminum, crushed stone, electrical conduits, flexible insulation, gypsum board products, hardboards, internal combustion engines, kitchen steel cabinets, lime, metal lath, metal office furniture, nonferrous castings, open die press and hammer forgings, pole line hardware, ready-mixed concrete, small pneumatic compressors, sand and gravel, screws, solid rivets, structural clay products, tar processors and wire mill products.



INDIANA HARBOR OVENS AWAIT CHARGING
first coke will be pushed this week

Thinner Than Ever

Executive warns steel profits are being held down to an unhealthy level

THE STEEL INDUSTRY'S earning position is so unsound as to cause deep concern to all responsible leaders in the industry.

So said J. L. Mauthe, president of Youngstown Sheet & Tube Co., Youngstown, O., in a talk before the Ohio Valley Credit Conference. His intention was not to undermine the credit standing of the industry. Mr. Mauthe was pointing up the rapid decline in steelmaker's profits over the past two years, and calling for a recovery.

Little Enough — Citing the 70 per cent more steel produced in 1951 than in 1929 and the tripled dollar sales in the same period, Mr. Mauthe concluded that 1951 should have been a "princely" profit year. Yet, profits were only 6 per cent on a dollar of sales in 1951 and they're running about 3½ cents this year.

Even those figures are misleading, says Mr. Mauthe. If tax laws permitted charging off depreciation at a realistic rate, that is based on the cost of replacing plant and equipment at today's prices instead of at old purchase prices, the rate of profit picture would be truer.

Medieval Method—Blood-letting of profits in what should be regenerating years weakens the industry by either seriously limiting dividends to stockholders or by slowing down modernization of techniques and equipment.

Partial returns on steel companies' third quarter profits are shown in the table below.

Third Quarter Net Earnings of Selected Steel Companies

	3rd QUARTER, 1952	2nd QUARTER, 1952	3rd QUARTER, 1951
Armco Steel Corp	$7,740,292	$6,550,752	$6,094,354
Barium Steel Corp	858,978	575,984	614,206
Bethlehem Steel Corp	17,116,975	5,378,685	18,460,372
Colorado Fuel & Iron Corp	577,900	409,745	2,045,711
Detroit Steel Corp	967,786	533,447	2,955,939
Inland Steel Co	4,794,694	4,408,590	7,748,751
Jones & Laughlin Steel Corp	810,000	—110,000	20,575,000
Kaiser Steel Corp	1,666,492	2,456,998	2,515,677
McLouth Steel Corp	1,258,103	476,346	1,102,018
Pittsburgh Steel Co	1,811,721	347,220	1,535,357*
Republic Steel Corp	5,158,092	4,502,543	12,496,763
U. S. Steel Corp	30,405,472	22,218,922	27,936,060
Wheeling Steel Corp	840,523	436,311	3,320,610
Youngstown Sheet & Tube Co	2,546,846	1,465,831	7,194,334

*estimated

Costs Top Estimate

Labor and material charges at Indiana Harbor exceed Youngstown's original plans

FRANK PURNELL has a great sympathy for Mr. Blanding who once built a dream house. The Youngstown Sheet & Tube Co. chairman says costs for the company's expansion program at Indiana Harbor are running 20 to 40 per cent above estimates received when the project was started two years ago.

Part of the increased costs stems from higher material and labor rates, but a substantial portion results from premium overtime payments necessary to induce men to work.

Steel Price Too Low—Commenting on the sharp rise in steel mill construction costs during a progress inspection at the Indiana Harbor Works, Mr. Purnell suggested that steel prices should go up $20 a ton if based on present costs.

The July wage settlement has boosted steelmaking costs $10 a ton. The indirect results of that settlement are now being reflected. Iron ore prices are up 75 cents a ton and other materials and services purchases are also rising.

Delayed—Sheet & Tube's Indiana Harbor expansion, like all steel ex-

pansion projects has been delayed months by the steel strike, by the shortage of steel under government control and by the scarcity of manpower. The project is now past the halfway mark and the basic steelmaking plant is nearly done.

What's Involved — Five of the eight open hearths are now in production. The remaining three will be completed late this year. The open hearths are rated at 250 tons but are producing around 265 tons a heat.

First coke will be pushed from the 75 new coke ovens this week. Capacity will be 180,000 tons annually.

A new 28-foot blast furnace will be completed around year's end and probably will start production early in 1953. It is expected to produce 1600 tons daily.

A new blooming mill is under construction and will be completed in the summer of 1953.

Foundation work is underway for a 4-stand cold mill, and completion is scheduled in April, 1954.

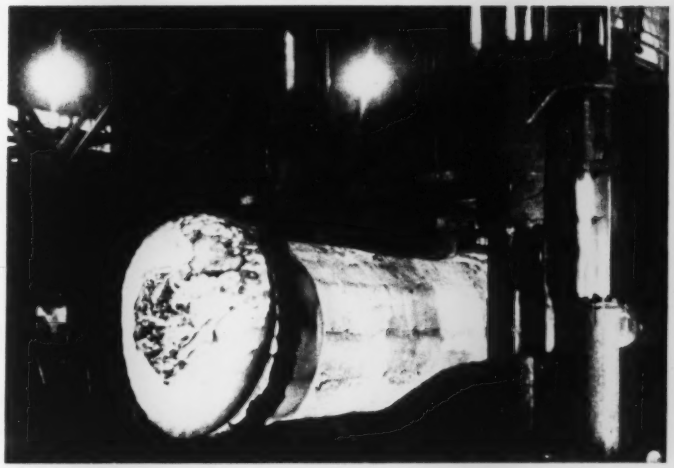
Discontinue Bessemers — When the first new open hearth units were started, the company abandoned two bessemers with a rated capacity of 330,000 tons annually. The net increase in steelmaking capacity resulting from the eight new open hearths and the abandonment of the bessemers is expected to be slightly more than 1 million tons.

Taconite by 1957 — Mr. Purnell says his company will be using concentrates from taconite in quantity by 1957 and that the unit cost of the concentrates is expected to be comparable to other ores.

Republic Winds Up Expansion

First heat from the last of four new open-hearth furnaces marked the completion of production facilities expansion in Republic Steel Corp.'s $75 million program last Wednesday. Increasing the firm's annual steel production by 672,000 tons, the project included a new 126-oven by-product coke plant, a 1440-ton blast furnace, new soaking pits and improvements to the 32-inch blooming mill.

Final odds and ends yet to be wound up by the first of the year include completion of a cold reducing mill.



Massive Ingot Will Form 70-Foot Column

Above, a glowing steel ingot weighing 722,000 pounds and cast in a mold 134 inches in diameter is seen at the Bethlehem, Pa., plant of Bethlehem Steel Co. The ingot will be converted into a 70-foot column for a 25,000-ton aircraft forging press which will be capable of forging large aircraft parts in a single operation.

Caution Marks New Expansion Plans

IF YOU READ between the lines in Defense Production Administration's newly stated policies on mobilization expansion, you find this:

A more cautious approach aimed at filling in the chinks of the expansion since mid-1950, the bulk of which is now or soon will be completed. Some 176 industries are listed as set for expansion, but that list will probably be changed and cut sharply.

An about-face on steel. Originally, Washington planners had many elaborate programs for the industry. Now they're cut to only three. Pig iron, ferroalloys and castings. The reason, again, is a new caution. (See p. 70.)

Although 176 industries are listed as set for expansions, these ten, including the three in steel, are probably the most important:

1. Additional **aluminum sheet** capacity of 684 million pounds by Jan. 1, 1955. Increase in **aluminum sheet and plate heat treating** facilities of 846 million pounds annual capacity by Jan. 1, 1955.

2. A total of 3 million net tons annual capacity for **steel castings** by Jan. 1, 1955. That's an increase of 500,000 net tons over capacity on Jan. 1, 1950.

3. For **ferroalloys electric furnace products**, DPA wants a total capacity of 1,275,000 kw, an increase of 511,000 kw over capacity of Jan. 1, 1951.

4. The aim for **ferroalloy blast furnace products** is an increase of 400,000 net tons by Jan. 1, 1954.

5. Interim goal for additional private investment in facilities for the production of **ordnance items** is set at $300 million.

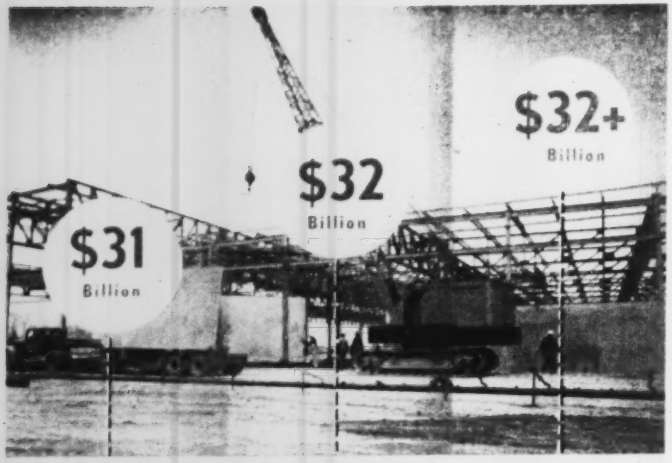
6. **Synthetic cryolite** target of 60,000 net tons annual capacity in 1954 requires a gain of 46,600 net tons of capacity.

7. For **metal can manufacture**, a further capital investment of $31 million by Jan. 1, 1956, and total capacity for making metal cans of 4.7 million tons.

8. An interim capital investment in productive capacity for **business machines, laundry equipment** and **commercial cooking equipment** and other items of $31 million.

9. Additional capital investment of $50 million for added production capacity of **high voltage switchgear** and related equipment.

10. Fifteen million dollars in capital investment for facilities to produce "AA" type **dry cell batteries** needed for the military.



UP Goes Construction

Next year will see a decrease in some types of priority construction, but construction volume should be maintained or exceeded as freed materials filter down to low-priority levels

CONSTRUCTION IS bulldozing its way to a new high in 1952 and chances are good it won't be going down the other side of the hill until after 1953.

New construction totaled over $31 billion in 1951 and indications are that it will reach about $32 billion in 1952. Construction in 1953 should equal or perhaps even better the figure slightly. Here are some of the reasons why.

Industrial Construction—Hitherto the stretchout in defense spending industrial building will only edge over the $2 billion mark this year, probably should fall slightly short of the figure next year. But while most of the large industrial expansions have been or will be completed soon, smaller industrial expansions which have been held back because of the lack of materials should take up much of the slack. Watch for a shift to smaller projects here, but only a slight decrease in overall volume, possibly even a slight upturn as the cramped alloy shops get a crack at materials.

Housing—About one third of the total annual construction figure is residential construction. Running over one million starts annually for the last three years, present indications are that there will be a slight drop to about 900,000 starts in 1953. However, any decline in residential housing should be more than offset by increases in public construction and public utility expansion. Public housing will definitely be up in 1953 and there will be a sustained demand for additional electric lights, power, gas, water and sewers. Farm construction should be about the same.

Public Roads — Total cost of highway construction in 1952 will be slightly above the $1.5 billion level of 1951, but in 1953 the federal aid program should accelerate federal highway construction beyond the rate for any previous year. There is also a good possibility that state, county and city highway construction will equal or exceed the expanded federal aid program.

Military Requirements—Though Army and Air Force requirements for direct troop use in 1953 will be slightly below current requirements, military construction for outlying bases will amount to $2.3 billion in 1953. About 75 per cent of this amount will be used for constructing utilities, including ground work, road and runway construction.

So the outlook for construction in 1953 is for some shifts in the type of construction being done, but the construction volume should remain at the high level being attained this year.

Fast Write-offs Slow Down

Certificates of necessity are coming in driblets from the Defense Production Administration as major defense expansion goals become filled. DPA now concentrates on a policy of determining critically needed facilities and of more selective grants to round out established goals. During August and September approvals of certificates fell below $100 million a week for the first time since the program's birth. In contrast, the weekly rate of approvals from February through April of this year was about $540 million.

On Sept. 30, 1952, 176 industries and projects had goals approved by DPA. Some 76 goals were pending. Defense expansion completions had reached 57 per cent of the goal (STEEL, Oct. 20, p. 64). Impeding progress were lack of steel and certain tools.

Applications are also slowing up. During the peak period of February and March, 1951, applications reached the rate of $1 billion a week. In the week ending Sept. 10, 1952, filings slumped to $94 million.

Producers of iron and steel received 66 certificates from June 20 to Sept. 5. The total included $18.5 million of expansion. Some 22 grants covering $20.1 million were made to nonferrous producers.

A total of 13,602 write-offs totalling $13.5 billion have been issued by DPA as of Sept. 5. Pennsylvania has received the greatest dollar value, with Texas second, Ohio third and Michigan fourth.

On a sectional basis, the East North Central states (Ohio west to Wisconsin) lead in number of certificates, 3888, and dollar value, $4 billion. The Middle Atlantic States followed with 2572 permits and $3.2 billion in approvals.

Mid-Air Forging

Chambersburg Engineering introduces an "impacter" which may foster new forging ideas

NEW CONCEPTS in forging methods and another look at die-design principles will be fostered by the introduction of an "impactor" by Chambersburg Engineering Co., Chambersburg, Pa.

Impacting is forging in mid-air. The impactor socks the suspended forging blank from both sides at the same time. Principle on which it is based is a law of physics. When two inelastic bodies of equal mass collide traveling towards each other at like speeds, both bodies come to rest with a complete absorption of energy.

How It Works—In the impactor the two opposing members are called impellers. They carry the dies for forming the forging and are moved in a horizontal plane by compressed air in similarly opposed cylinders. The stock is positioned in the impact plane in which the two dies collide.

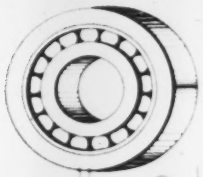
One big advantage is that with the stock being worked from both sides there is a more uniform grain flow. The center of the blank becomes the point of relative zero velocity. Also less energy is required to do a forging job by impacting.

In Operation — An installation for Packard Motor Car Co. will be used to make jet engine blades. Stainless steel knife handles are being made at the International Silver Co. by the impacting method. Thompson Products Co. is cold coining jet blades on an impactor. Oldsmobile Division of General Motors will use an impactor for forging rough blades.

Forging Order Under Approval

The proposed forging ceiling price order is being circulated among OPS lawyers and top officials for final correction and approval and should be announced shortly.

Quite similar to CPR 60, the proposed order bases ceilings on forgings on the prices prevailing as of Jan. 26, 1951, adjusted for later cost increases.



Antifriction Bearings:

Sales Rolling Freely As Industry Uses More

BICYCLE DESIGN was revolutionized about the turn of the century with the utilization of antifriction bearings. The bicycle market, in turn, gave the first solid nourishment to the infant antifriction bearing industry.

Since that time antifriction bearings have rolled into modern industry in a big way. One-half of one per cent of the total finished steel used in this country last year—265,000 tons—went into the production of antifriction bearings, reports the Antifriction Bearings Mfgrs. Assn. The top customer of the 66 manufacturers of antifriction bearings in this country is still the transportation field. The average automobile requires 30 antifriction bearings, with diesel locomotives and aircraft coming in with a strong demand on the total $500-million annual output.

Some Bearings Seized—Although the bearing supply situation is seized at some points, backlogs are dropping and many sizes are available from stock. Moderately tight are special sizes like roll neck bearings and back-up roll bearings used in the steel industry. They require from three to four months for delivery. Tightest are extremely low-volume and odd sizes which must be made to special order and may be over a year in arriving.

Supplies of 52100 alloy steel, the leading material consumed, are fairly satisfactory, but trouble comes with some specialties and sizes. Many plants have expansion programs under way or completed and the outlook is for backlogs to continue downward until a normal supply-demand position is established. Many of the bearing plants blasted in Germany during World War II are back in production, but imports are less than one per cent of total volume sold in the U. S., while American exports this year will be approximately $25 million.

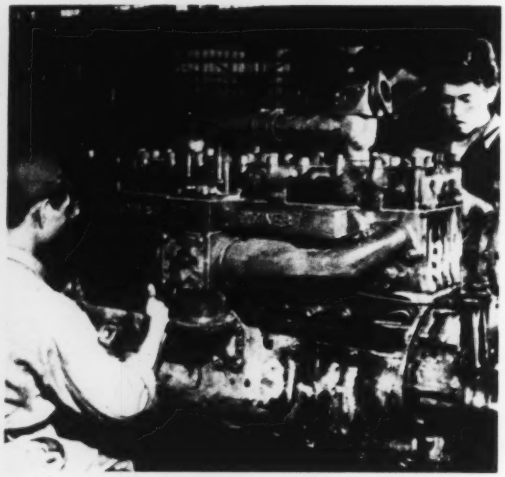
A Bearing on Defense—Defense is a big factor in shortages, with such firms as Norma Hoffmann Bearings Co., Stamford, Conn., diverting 85 to 90 per cent of its output to the military. Needle bearings are being used increasingly in the aircraft industry, and electronics equipment is contributing to a greater demand for smaller sizes and increased accuracy.

Industry demands are moving somewhat in the same direction. While more bearings are being used by industry than ever, there is a strong trend in demand toward smaller sizes.

Friction in Antifriction — The bearing makers have their problems. Some are technical, like how to get steel for use in bearings that will be stable enough to operate at high stress in temperature ranges of from 800—1000 F while holding a tolerance of 0.0002 inch. If the steel problem can be solved, there still remains the matter of lubrication. No lubricant now available will stand up at these temperatures, so grease people are working with steel and bearing producers on the problem.

Other problems are financial. Most companies aren't being squeezed abnormally profitwise, but bearings are selling under ceiling prices in most cases. Competition from abroad is not cut-throat, but it's keen, says SKF Industries Inc., Philadelphia. Labor cost in the production of bearings is particularly high and this coupled with the competition in the industry contribute to keeping the prices down. Facilities expansion doesn't promise much toward lessening competition in the future.

However, with countless new applications developing in industry's fight against friction, and America's urge to be on the move, bearing demand should roll along freely for a long time to come.



They're Teaching Old Army Trucks New Tricks

Rehabilitation of military trucks to meet present standards is a multi-million dollar business wherever U. S. armed forces equipment is stored. At the left above, a line of Army trucks awaits rebuilding to new equipment standards by ACF-Brill Motors Co., Philadelphia. Current orders surpass $6 million. At the right, Japanese workmen at the Fuchu Ordnance Depot prepare an intricate engine to be completely overhauled. An Army project begun in 1948 has recovered and rehabilitated thousands of similar vehicles left in the Pacific theater after World War II.

How To Lower Unit Costs

Gearmakers told best answer lies in intelligent machinery replacement program

THE BIG HOPE for lowering unit costs lies in the methods and processes of manufacture. This is virtually the only aspect of business which is still controlled by private management.

Other cost factors—wages, materials prices and taxes—are controlled by government or by the government and labor unions. Product price is controlled by the government.

Recognizing these facts, members of the American Gear Manufacturers Association, meeting at the Edgewater Beach Hotel, Chicago, Oct. 27-29, paid particular attention to any suggestions for lowering unit costs.

How To Do It—An intelligent program for machinery replacement is suggested by Robert S. Collier, plant manager, Cincinnati Milling Machine Co., as the No. 1 approach to better manufacturing methods and processes in the future.

"No live industry can keep pace with the advance of technology without continuous renewal and transformation of its productive facilities. Existing equipment must be kept on the defensive, compelled always to justify its tenure against the challenge of new and more modern machines," Mr. Collier told the association.

What Formula?—A good formula for re-equipment, says Mr. Collier, should include the following factors:

1. Direct labor savings.
2. Indirect labor savings.
3. Depreciation and obsolescence.
4. Interest on money invested.
5. Difference in maintenance costs between old and new equipment.

MAPI the Answer—Mr. Collier suggested the formula advanced by the Machinery & Allied Products Institute (MAPI) in its book "Dynamic Equipment Policy" is probably the best formula advanced to date.

The gearmakers devoted considerable discussion to the problems of renegotiation, price pass-through and to the desirability of maintaining adequate representation in the defense organizations in Washington.

CHECKLIST ON CONTROLS

Materials Orders

CLAD STEEL—Amendment 2 of NPA Order M-1, issued and effective Oct. 23, 1952, increases the lead time of clad steel products, principally sheet, strip and plate, by 45 days.

OIL COUNTRY GOODS—Direction 6 to NPA Order M-46 and Direction 4 to NPA Order M-46A, issued and effective Oct. 28, 1952, impose controls on casing, tubing and drill pipe produced.

SELECTED DEFENSE CONTRACTS IN EXCESS OF $100,000

PRODUCT	CONTRACTOR
Boring Machines	De Vlieg Machine Co., Ferndale, Mich.
Motor Generators	Bogue Electric Mfg. Co., Paterson, N. J.
Generating Sets	A. G. Schoonmaker Co., Inc., New York
Bombs, 10-lb.	Kold-Hold Mfg. Co., Lansing, Mich.
Cartridges, Ignition	Federal Cartridge Co., Minneapolis
Machine Gun Mounts	Aircraft Armaments Inc., Baltimore
Trucks, Tractor, 5-ton	Mack Mfg. Co., New York
Trucks, Dump, 5-ton	Mack Mfg. Co., New York
Light Trucks	General Motors Corp., Detroit
Pickup Trucks	Chrysler Corp., Detroit
	Ford Motor Co., Dearborn, Mich.

from imported semifinished steel. Order M-46 applies to United States and Canadian operators, and Order M-46A covers foreign operators.

OIL COUNTRY GOODS— Direction 7 to NPA Order M-46, and Direction 5 to NPA Order M-46A, issued and effective Oct. 28, 1952, permit oil and gas operators to trade or exchange oil country tubular goods or line pipe under certain conditions.

Controlled Materials Plan

CARBON STEEL—Direction 18 to CMP 1, effective second quarter, permits those consumers under the automatic allotment program to self-allot for the second quarter 100 per cent of the carbon steel they received in the third quarter, 1952. The current percentage for automatic allotment is 60.

NPA Delegation

APRA "B" PRODUCTS—Amendment of Oct. 23, 1952, of Supplement 1 to NPA Delegation 1 authorizes the defense secretary, under certain conditions, to permit scheduling or rescheduling of deliveries of orders for Aircraft Products Resources Agency B products placed in support of the military aircraft program. The amendment was effective Oct. 23.

Price Regulation

IRON ORE—Amendment 1 of CPR 169, issued and effective Oct. 24, 1952, provides a pricing method for iron ore mined in the Spring Valley area of southern Minnesota similar to that in effect for ore mined in the Lake Superior region. The price adjustment should apply to all deliveries since July 26, 1952. It also provides for establishing ceiling prices by individual order for all cases where a seller is unable to determine his ceiling prices under this regulation. Amendment was effective Sept. 17, 1952.

Propose More Civilian Tools

Increased civilian allotments of machine tool production may result from a proposal before the Defense Department to amend NPA's order M-41. This order reserves 70 per cent of current production for direct military requirements, while the amendment would cut that figure to 60 per cent.

To allow civilian users more certainty of receiving their orders of tools, unrated orders would not be subject to displacement after entering the frozen period in builders' production schedules under the suggested amendment. Net effect would encourage placing of unrated orders with tool builders.

PAD Allots Tubing, Casing

PAD granted priorities assistance to 1804 oil and gas operators for first quarter, 1953, purchases of 261,527 tons of casing and tubing from regular mill production.

Tonnage allotted for the first quarter represents 30 per cent of the amount needed by operators to carry on planned drilling programs and build up inventories depleted during the steel strike. Compared with the 261,527 tons available for allotment, PAD figured first quarter needs at 868,830 tons.

The allotted tonnage represents primary authorizations and amounts to about 80 per cent of the casing and tubing tonnage expected available for the quarter.

PAD will later grant priorities assistance on casing and tubing to be produced for the first quarter from conversion steel.

Rx MANAGEMENT CLINIC

KNOW HOW TELLS HOW industry solves its problems. Metalworking executives will be interested in reading YOUR comments on the problems or on opinions expressed.

Cutting Oil Quirk

● In almost every department there is at least one employee who is afraid of the job or what might happen. He is not producing efficiently when he fears the equipment he is working on. He may be on the job physically, but he is not producing mentally. Authority can fire this man, but good leadership can save him.

We must make sure the operator knows all there is to know about machine, tools, equipment and cutting oil before criticizing something undone. As the man is a good operator physically, a little time spent in teaching him the how, why, when and where should make less headache for everyone in the day's work.

If the operator still complains about the oil after this training, I would suggest this method of correction. Take the operator into the office and begin by asking questions. Then let him know you consider him a good operator aside from this one fault. Praise all his good qualities, but inform him he is supposed to produce mentally as well as physically. Let him know you are sure he can do so and you are depending on him to correct this fault.

In this way you have given him a reprimand, at the same time a reputation to live up to. This is the best way I know to correct a fault without resentment or discord.

A. E. SALMONS, Tools Supervisor
Dixon Valve & Coupling Co.
Philadelphia

Foremen Feuding

● First of all, placing two very capable people in practically the same supervisory job and the same location within a plant is always going to be troublesome. Some differentiation should be made between the two jobs in the line organization of the plant. Even the procurement of duplicate machinery to accomplish the latter consideration may pay off handsomely.

Another method by which such a problem as this may be solved is through the use of a foreman's bonus plan. A monetary incentive is one of the world's best persuaders for the cause of co-operation. When two foremen are brought to realize that their working together will mean extra cash in each of their pockets, you'll get your teamwork.

W. E. PORTER
Lisbon, O.

THIS WEEK'S PROBLEM

"It seems as though when you give employees an inch they always take a mile. If you let them have time off for a cup of coffee without a reprimand, the first thing you know they're forming groups that meet regularly to have coffee. Their conversations get longer until the five-minute coffee break has become a half-hour club meeting every morning and afternoon.

"The same thing is true of time off for smoking, excusing lateness or any other kindness management shows its employees. Instead of accepting management's action as a favor to be returned by added output, employees come to expect the time off as something due to them and stretch it longer and longer until the thing just runs into the ground.

"If such breaks run only a half hour out of an eight-hour shift, management is losing one-sixteenth of its production while its labor and overhead continue. That means millions of dollars out of management's pocket annually. How can management be fair to its employees, yet have the employees be fair to management as well?"

Send your comments or your pet problem to "Management Clinic", STEEL Magazine, Penton Bldg., Cleveland, O.

Windows of Washington

NPA'S IRON AND STEEL CAPACITY EXPANSION
from frightening the Russian bear to bearing the frightening rush

The build-up in steel capacity no more than gets near the goal than the worry starts over how to keep intact some of the facilities that may turn out to be surplus

THEY'RE having a good chuckle out of a story going the rounds in the capital about the politician who called on one of the federal departments in an effort to get a job for his son. "What can he do?" queried the department head. "Nothing," replied the politician. With an air of satisfaction the department head responded: "Good! That simplifies matters. We won't have to break him in."

If there is such a snap job around here some of the high-placed officials couldn't be blamed for wanting to retreat to it once in a while just for a respite from the Washington worries.

No Rest—The government men thought they were just about to the point where they could relax the brows they've furrowed over problems of boosting the country's steel capacity to a size the Russian bear would respect.

Now that the capacity is nearing the goal they're beginning to be concerned over what will happen if there isn't enough sustained demand to keep all of it operating.

If defense requirements remain high and civilian business dontinnies to be good we won't have to worry, they say, about idle capacity. But if there's a shrinkage in either defense requirements or civilian needs, or both, what will we do to prevent junking of facilities that might be needed in a hurry."

How They're Thinking—They're toying with several ideas. The steel companies might be given some special tax treatment that would enable them to keep idle facilities in standby condition. There might be a voluntary allocation program that would channel part of the production of high-cost facilities to consumers. The government might pay costs of maintaining standby capacity. The government might make an outright purchase of uneconomical capacity.

The latter alternative, although affecting only a segment of steel capacity in the United States, could be labeled "nationalization," a fate that befell the entire British steel industry.

Inescapable Question—If surplus capacity in the steel industry becomes nationalized couldn't the same method be applied to other vital industries, the machine tool industry, for instance?

Steel Pricing: What To Expect...

Talk of surplus capacity inevitably brings up the topic of pricing. Already some of the steel mills farthest from principal consuming areas sense a reduced pressure for deliveries for next year. Ever since the basing point decision influenced them to adopt mill pricing and let the steel buyer pay the freight costs the mills have not had to scratch for business. But if the tide of demand goes out, what will the mills at an economic or geographic disadvantage do? One of the country's prominent steel company officials unequivocally told the Federal Trade Commission his company would absorb freight, when the going gets tough.

The chances are no actions will be brought by the FTC where freight absorption is involved unless a standard rate book or too obvious follow-the-leader pricing are indulged in.

The basing point decision will stand as far as the antitrust agencies are concerned.

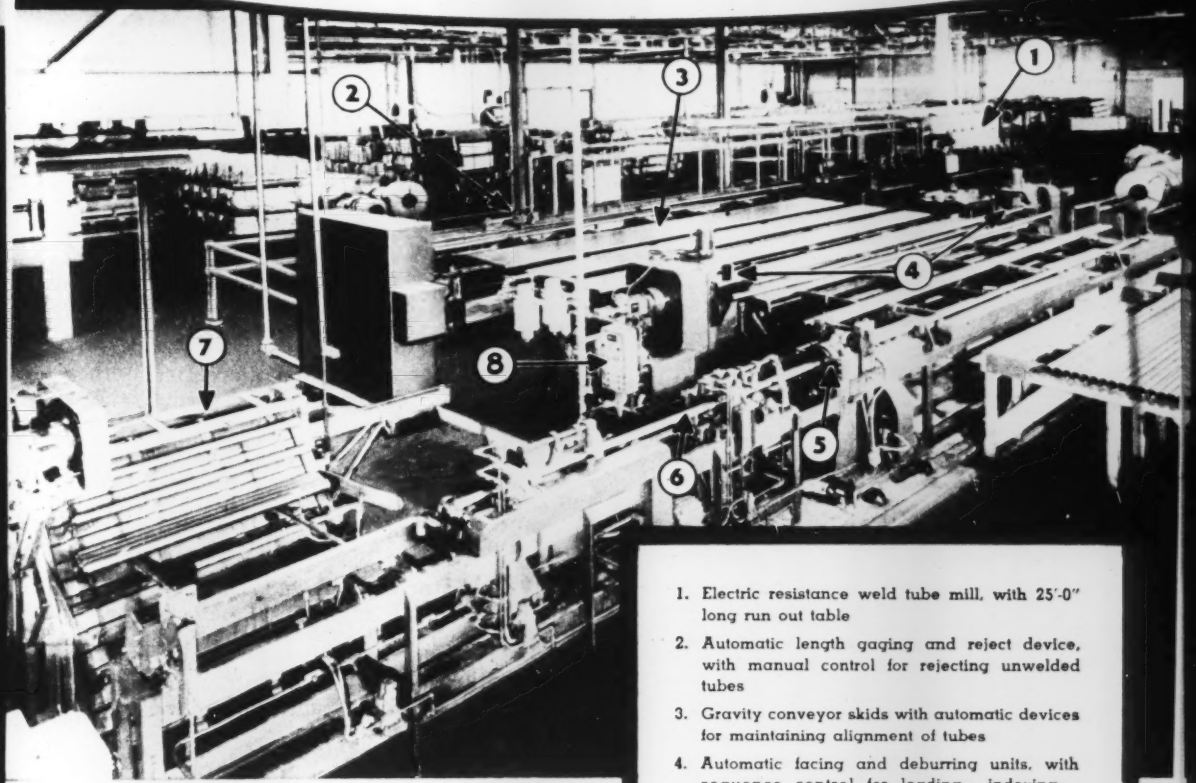
There is some chance, however, that a bill which passed the Senate last year and which provided that meeting competition is a complete defense to a price discrimination suit would pass Congress in the next session. A change in the administration could mean that the President would sign such a bill.

Toward a Planned Economy . . .

From the capital swirl you can legitimately conclude that more and more of our economy is becoming a planned one. Maybe that's all for the better, say some people. Most everyone agrees that a little planning is better than aimless wandering. There's already belief that fears of a recession in 1953 have set enough government and business people to planning against one that the effects of an economic downturn would be reduced substantially.

One facet of this planning is the establishment of a distribution section in the U. S. Commerce Department. Its secretary, Charles Sawyer, points out something that is becoming widely recognized. Our production is limited now only by our ability to consume. This means, "American industry must put forth as much effort in connection with distribution techniques as it has with production techniques." A requisite, he emphasizes, is continued development of advertising and marketing.

Special
DUNCAN-McKAY
Completely Automatic Cut-up Line
FOR TUBE FINISHING OPERATIONS



1. Electric resistance weld tube mill, with 25'-0" long run out table
2. Automatic length gaging and reject device, with manual control for rejecting unwelded tubes
3. Gravity conveyor skids with automatic devices for maintaining alignment of tubes
4. Automatic facing and deburring units, with sequence control for loading — indexing — clamping — cutting and unloading tubes
5. Duncan-McKay automatic tube cutoff with magnetic conveyor rolls — positive hydraulic feed and hydraulic torque converter drive for the cutting head
6. Mandrel end — with automatic length gage — magnetic exit conveyor and automatic dumping device
7. Automatic exit conveyor for cut length tubes
8. Operating control station with push button control of all automatic functions.

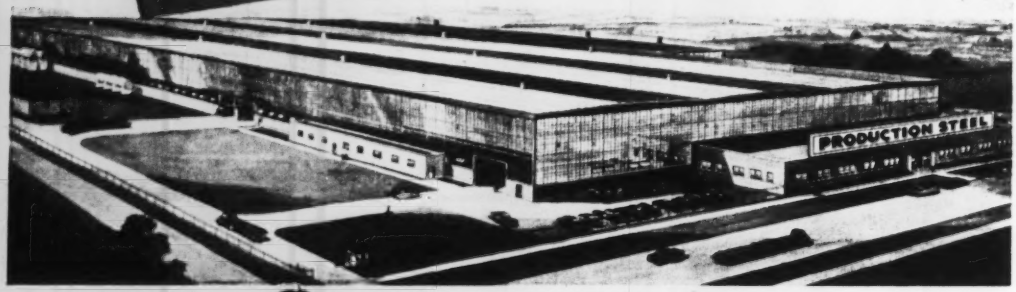
Finishing and cutoff operations have always proved to be a bottleneck in tube production. The McKay Automatic Cutup Line at Ford's Mound Road, Detroit Plant, provides complete automatic control of length gaging — facing — chamfering and cut to length operations for Ford's rear axle and torque tube requirements. Ford's policy of "Automation wherever Practical" really pays off here with increased production—closer tolerance control—less scrap loss and reduced cost per piece.
If you have a similar problem, contact McKay engineers.

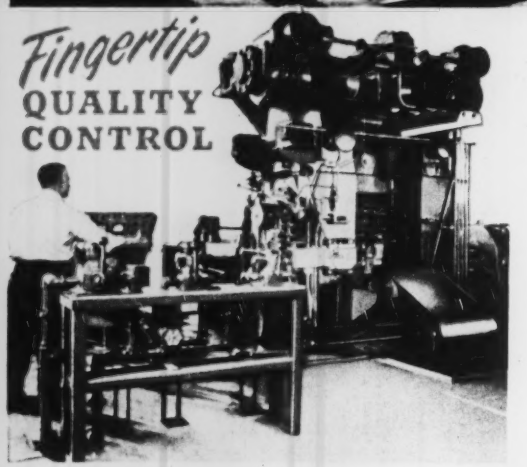
ENGINEERS AND DESIGNERS OF
EQUIPMENT FOR THE AUTOMOTIVE,
FABRICATING AND STEEL INDUSTR

McK

The McKAY MACHINE Company
YOUNGSTOWN, OHIO

Complete Steel Service* from One Source




Fingertip
QUALITY
CONTROL

This completely modern plant with latest type equipment for *rolling* strip and processing sheet and strip steel is your ideal source for:

- Warehouse stocks in sheets, plates, coils, cut lengths . . . All tempers and finishes.
- Steel strip in coils and cut lengths . . . restricted tolerances, all tempers and finishes.
- Roller leveling, pickling, annealing, shearing, slitting and skin rolling.

PRODUCTION STEEL STRIP CORPORATION supplements our regular warehouse service with custom steel at mill prices. This new, 4-high, reversing type cold strip mill with its modern, electronically operated *fingertip* quality control affords unusual flexibility in supplying steel strip to your exact specifications. Thickness .025 to .125 in all tempers and either bright or satin finish, can be processed to your exact width in coil or cut lengths.

PRODUCTION STEEL

WAREHOUSES:

PRODUCTION STEEL COMPANY
20001 Sherwood Ave., Detroit 34, Mich.
Phone: TWinbrook 3-5000

PRODUCTION STEEL STRIP CORP.
20001 Sherwood Ave., Detroit 34, Mich.
Phone: TWinbrook 3-5000

PRODUCTION STEEL COIL, INC.
20001 Sherwood Ave., Detroit 34, Mich.
Phone: TWinbrook 3-5000

PRODUCTION STEEL CO. OF ILLINOIS
2801 Roosevelt Rd., Broadview, Ill. (Chicago)
Phone: MAnsfield 6-4242

SENECA STEEL SERVICE, INC.
1050 Military Rd., Buffalo 17, N. Y.
Phone: Riverside 7920

SALES OFFICES:

PRODUCTION STEEL COMPANY
1002 E. 81st Street, Indianapolis, Ind.
Phone: Broadway 3468
E. W. Richardson, Sales Representative

PRODUCTION STEEL COMPANY
548 W. Mechanic Street, Jackson, Mich.
Phone: 2-9097
Glenn Christman, Sales Representative

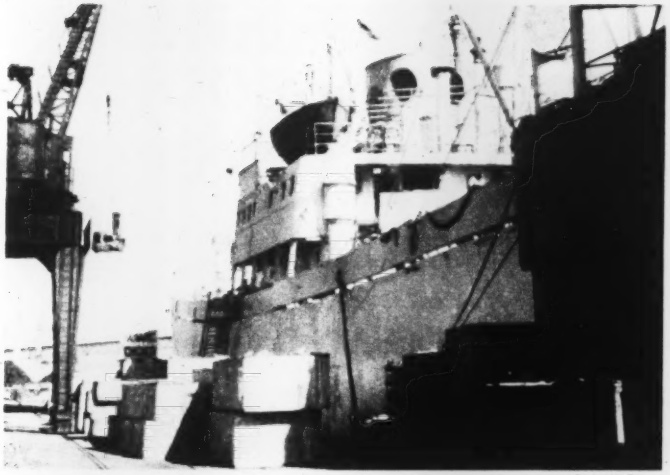
PRODUCTION STEEL CO. OF ILLINOIS
5226 N. Bay Ridge Ave., Milwaukee, Wisc.
Phone: WOodruff 2-1706
H. Clive Morrison, Sales Representative

SENECA STEEL SERVICE, INC.
739 Westchester Ave., Rochester, N. Y.
Phone: Culver 7480
W. J. Knoll, Sales Representative

SENECA STEEL SERVICE, INC.
1347 Northcliffe Rd., Syracuse, N. Y.
Phone: 73-5722
Dean Hetherington, Sales Representative

SENECA STEEL SERVICE, INC.
347 Price Street, Jamestown, N. Y.
Phone: 5759
S. N. Olmsted, Jr., Sales Representative

PRODUCTION STEEL COMPANY
1040 High View Lane, Green Bay, Wisc.
Phone: Howard 7407
Tony Canadeo, Sales Representative



Detroit Times

Can We Maintain Exports Despite Dollar Shortage?

The *Borghulm* of the Swedish-American Line loads a cargo of trucks and automotive parts at the port of Detroit, second largest in the country in value of cargos handled with nearly $1 billion of exports in 1952. Yet, shipments through Detroit have fallen off during the last three months except for Canadian trade and port officials blame deficit trade between the U.S. and other countries

American Exporters Look for a Way Out

U. S. exports may hit $16 billion this year, a post-World War II high. But, it is increasingly difficult for U. S. exporters of civilian goods to get around dollar shortages

EXPORTS of goods and services of the U. S. may well hit the $16 billion mark for 1952. But, it's getting more difficult each year to sell the same dollar volume of civilian goods in foreign markets.

Road blocks to trade take two forms: Dollar shortages in overseas countries (which is nothing new, but it's keeping U. S. sellers out of some of their best foreign markets—in Brazil, for example); and governmental restraints.

Strong Statistics—A comparison of selected metalworking exports shows little cause for alarm. For the first half of 1952, compared with the first half of 1951, exports of industrial machinery amounted to $820 million against $658 million in 1951; electrical equipment totaled $301 million against $277 million; automobiles, parts and accessories, $586 million compared to $602 million.

That's little cause for alarm until the amount of military and mutual aid contributed in the two years is considered ($1.7 billion in all of 1951, probably $2.7 billion for 1952), plus the fact that dollar shortages are getting increasingly worse.

Answers for the Future—A long-range solution to the question is now being sought by the Bell Committee at the request of President Truman. Two suggested remedies: Free trade—no tariffs whatsoever in this country or elsewhere in the free world; international management—a supernational board of trade. Some firms, however, are not waiting for the long-term outcome.

Micromatic Hone Corp. wound up its fiscal year, July 31, 1952, with a record-breaking export volume, amounting to 20 per cent of the company's over-all sales.

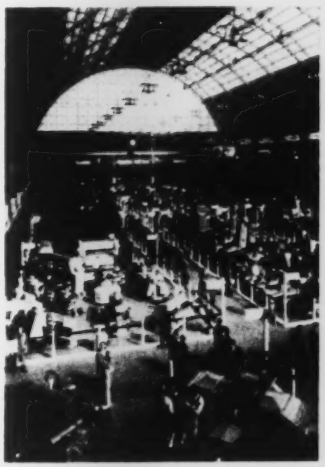
On the Other Side—In the face of increased competition, Micromatic licensed companies in England, France and Italy to manufacture the honing tools (just the tool, not the machine). That is helping sales in sterling areas like Australia which now can buy the replacement tool in England. A company has been licensed in England to make Micromatic's entire line of machine tools.

Burroughs Adding Machine Co., which usually counts on foreign sales for 25 to 30 per cent of its total, transferred its complete facilities for making calculators from Plymouth, Mich., to Strathlevel, Scotland. That Scottish plant now makes the Burroughs calculator for the world market.

More Dollars—The Strathlevel plant, plus one at Nottingham, England, assemble a virtually complete line of Burroughs machines from parts supplied from the U. S. Burroughs doesn't know whether the arrangement has increased the percentage of sales to overseas markets, but the dollar volume is definitely on the rise.

Tools Take a Bow

THE INTERNATIONAL Machine Tool Exhibition, Olympia Hall, London, England, was noteworthy for its authentic international flavor. Between 1300 and 1400 major machine tools were exhibited in the half-million square feet of the Olympia Hall. Nearly half of them of other than British



INTERNATIONAL TOOL SHOW

. . . stare and compare

manufacture. Countries represented were the U. S., England, Belgium, Germany, Italy, Switzerland, France, Denmark and the Netherlands.

Leonard Cardiner, president, and Irwin Lubalin, general manager of the International Machinery Division, British Industries Corp., came away with the following impressions:

American equipment stood out in two categories: High production equipment and special machinery for manufacturing jet engine components. British equipment was noted mainly for the array of standard machine tools with relatively simple design features. Swiss exhibits were marked by the showing of accurate and superbly-finished jig borers and measuring machines. German equipment showed an especially heavy use of electronic controls and included many heavy-duty shapers, planers and slotters.

Generally, there was widespread use of electronic control devices; almost universal use of copying attachments; development on new copying lathes and copying milling machines; increased rigidity, higher spindle speeds and wide use of anti-friction bearings on most machines for better use of carbide tooling.

Exporters Name Competitors

American metalworking exporters, when asked which country offers them the stiffest competition, repeatedly name four countries: Great Britain, West Germany, France and, gaining rapidly, Japan. The order of importance depends on the product in question.

Charles S. Helmig, president, Steel City Exporters Inc., Pittsburgh, says, "Great Britain offers the greatest competition, particularly in steel. Sweden presents no great problem because their exports are a highly specialized type of steel and the volume is small."

Harold Jones, Kurt Orban Co. Inc., says, "Competitors rank Germany, Great Britain, France and the Netherlands with Japan in there somewhere near the top. Japan ranks second in ship building now (the U. S. ranks third) and is making long strides in its postwar comeback."

GAS —BOON TO METALWORKING

The gas industry's $1-billion-a-year expansion rate means new markets for metal products, more fuel for metalworking companies

ONCE UPON a time—in 1895—the natural gas consumed in Texas was worth $20. The retail value of all the natural gas consumed in 1951 totaled about $4.4 billion.

The growth of the gas industry resembles something out of a fairy tale. The fuel was the neglected stepchild of petroleum producers for years. Now so great is the need for it that a special industry has arisen that will produce, distribute and market 7.6 trillion cubic feet of natural gas and 6 billion cubic feet of manufactured and mixed gases in 1952, compared with 6.9 trillion cubic feet of natural and 5 billion cubic feet of manufactured and mixed in 1951. What's more, still another and separate industry also is experiencing miraculous progress in marketing a natural gas cousin, liquefied petroleum gas.

Triple Assistance—Metalworking has benefited in three principal ways from the growth of the gas industry (and, too, from the lp-gas industry, a separate subject). The most spectacular help has come in the past 16 years, for gas sales have more than quadrupled since 1936. Metalworking has participated in this capital growth and will participate even more in the next four years, as the accompanying table indicates, by supplying equipment to produce, distribute and market gas. A second way the growth in gas sales helps metalworking is in the increasing manufacture of appliances and industrial equipment to use the fuel. A third benefit stems from metalworking's greater use of it in its own production processes.

Gas is one of the few areas of the economy where the peak in the current expansion program is still ahead. American Gas Association predicts it will come in 1953 when $1.7 billion will be laid out for capital improvements and expansions, almost all of which will eventually find its way into the sales figures of metalworking companies. Up to 80 per cent of the gas industry's capital expenditures go for pipe, and about 85 per cent of its total annual steel requirements are for that product. In 1953 it will need about 2.6 million tons of steel, 2.2 million tons of which will be pipe. More than 400,000 miles of utility gas mains are already under American soil, and still more are coming. Eleven major pipe line projects are currently underway or under consideration, plus dozens of smaller projects.

Opportunity—Pipe is a big thing but not everything in gas expansions. Besides pipe, some 400,000 tons of steel in 1953 will be used in compressors, motors, valves and other equipment for gas wells (some 65,000 are now in existence), gas cleaners, drying towers, compressor stations, underground storage, gas dispatching and district regulating for residential and commercial consumption.

Companies like Worthington Corp. and Cooper-Bessemer Corp.

CONSTRUCTION EXPENDITURES FOR THE GAS INDUSTRY*

(IN MILLIONS OF DOLLARS)

	ACTUAL 1951	ACTUAL 1947-1951	1952	1953	1954	1955	1956	FORECAST 1952-1956
PRODUCTION	158	732	127	147	113	108	108	603
TRANSPORTATION	873	2962	608	1135	822	279	242	3086
UNDERGROUND STORAGE	42	—	40	20	12	5	5	82
DISTRIBUTION	337	1272	349	341	325	310	314	1639
GENERAL	51	180	49	38	32	34	32	185
TOTAL INDUSTRY	1461	5146	1173	1681	1304	736	701	5595

*Figures supplied by American Gas Association

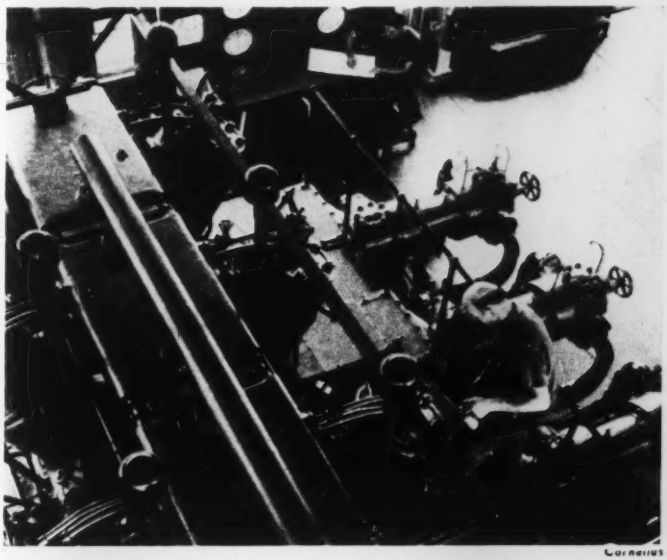
which supply gas firms with the equipment for expansion are virtually unanimous in their belief that the "demand from the gas industry will be excellent for the next four years at least."

Bonus — A second way metalworking plants benefit from the expansion in gas sales is through production of apparatus to use the fuel. Sales of most such devices is off from the peak performance in 1950 and 1951, but it's still far higher than 1939. For example, in the first eight months of 1952, gas range shipments hit 1,341,800, a decline of 17.2 per cent over the corresponding period of 1951, but close to the 1,501,000 sold in all of 1939. Automatic water heater shipments amounted to 1,205,200 in the same period, a decline of 13.2 per cent from 1951 but almost triple the shipments of 499,000 in all of 1939. Central gas heating unit sales reached 436,800 in the first eight months, 12.7 per cent gain over 1951 and nearly five times the 92,000 shipped in all of 1939.

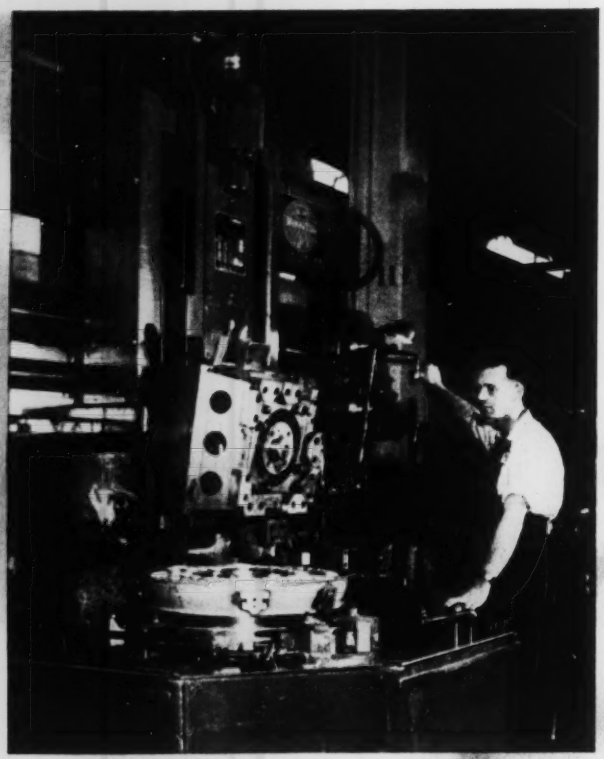
The market for gas appliances is by no means saturated because major areas still don't have the service, but expect to within the next two or three years. Regions without natural gas now are the Pacific Northwest comprising Washington, Oregon, Nevada and Idaho and the Northeast comprising Maine and Vermont. Washington, Oregon and Idaho will get gas by 1954-55, Nevada by 1953 and Maine by 1953-54.

The Third—Still another major help to metalworking which gas industry expansion affords is the increasing quantities of the fuel for metalworking's production. Today industry uses some 4 trillion cubic feet of gas annually, or nearly half of all that's consumed. That's more than double industry's consumption of less than 2 trillion cubic feet in 1939. Price is a big reason for the gain in use by industry (as it is for residential and commercial users, too). The cost of gas has climbed only 11 per cent since 1939, while coal has jumped 88 per cent and oil 117 per cent.

The sensational increase in the demand for and availability of natural gas is, of course, the big reason why metalworking currently finds the gas industry such a help. The present rate of capital expenditures can't last forever, but a big gas industry is now a reality. As such, it will always provide metalworking a sizable market for equipment in normal improvement and expansion projects. It will always supply the fuel and thus create a demand for appliances and equipment to use it. The industry will almost always supply plenty of gas for metalworking's own production purposes. So prospects are now good that the gas and metalworking industries can live together happily forever after.



Here's one reason why the gas industry needs metalworking products. So many are used in plants like this East Ohio Gas Co. compressor station



Pacemakers on the *Jet* PROGRAM

The inception of Man-Au-Trol Vertical Turret Lathe started a new manufacturing era in the boring mill field.

Man-Au-Trol manual or automatic control has taken the guess work out of previous manual operations on highly accurate repetitive work.

Automatic change of feeds and speeds at the proper instant, automatic change of direction of feed, automatic precision indexing of heads for succeeding operations — all contribute to the productive efficiency and minimum operator fatigue at a pace previously unobtainable in single spindle machines of the size and capacities of Man-Au-Trol.

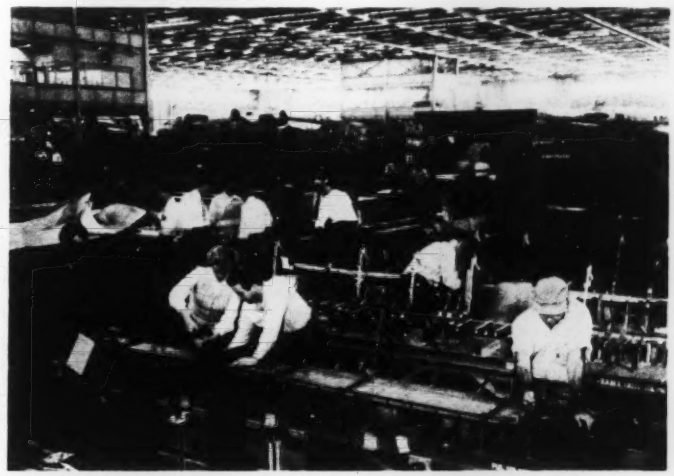
For "set-ups" or shorter run jobs, manual operation is quickly available without disturbing the settings for the automatic cycle.

Learn about the manufacturing efficiency of this machine as applied to your work.

THE BULLARD COMPANY
Bridgeport 2, Conn.

By H. C. TUTTLE *Detroit Editor*

Mirrors of Motordom



Kaiser-Frazer Tools Up for Transports

Tooling progresses rapidly toward large-scale manufacture of the new Chase C-123 assault transport at the Willow Run, Mich., plant of Kaiser-Frazer Corp. Workers, above, assemble a transversal floor beam for the air carrier. In the far background is a final assembly area for the Fairchild C-119 "Flying Boxcars." These are in production at the plant with several hundred automobiles daily

On 1953 models, builders will offer as optional equipment wire wheels, "continental" spare tire kits and other accessories that can easily double your original car investment

DETROIT

TIME WAS when a man who wanted to dog up his car had a choice of such things as chrome wheel discs and fancy bumper guards but not too much else, at least not from his car dealer.

All that is changing. For next year's models there is going to be available a selection of accessories and ornamentation by which a man can easily double his investment.

Continental Look—The most obvious additions he will be able to make will be "continental" rear tire kits, which extend his rear bumper several inches and hang his spare out where it will have to be moved every time he wants to get into the trunk, and wire spoke wheels which will be the curse of every car wash place in town. But besides these things the 1953 car buyer of some makes will be able to get new glamor for his grille by the piece—stainless steel attachments to be hung over the painted portions. He will be able to cover the weld seams on his rear fenders with special trim sold in accessory groupings. All in all he can make his car a shining monument to his affluence.

This is part of the auto industry's awakening to the influence of sports cars. The sports car purist deplores chrome for its own sake, but he admires the distinctiveness which now any American car buyer with the money in his jeans will be able to acquire. And it is a neat way for the automakers to cope with the cost problem. By the accessory group scheme they can make some of the frivolity in styling optional to the economy-minded buyer. This last is possibly of the greatest significance.

Look at Costs — The state of mind of next year's buying public is very definitely in the consciousness of the automotive industry and its dealers. The decision of Dodge, Chrysler and Kaiser-Frazer to hold the price line or lower it for most models and raise it on a few was not made lightly. It signaled more eloquently than any speeches the probable return next year of a highly competitive market.

L. L. Colbert, president, expressed Chrysler Corp. views and hopes this way: "It is our conviction that the time is fast approaching when, barring war, production restrictions can be suspended because of the demonstrated ability of our economy to carry defense along with the civilian job. And we believe that volume plus efficiency can do much to offset the inflationary trend still prevailing. . . Our constant aim is to improve quality and performance, safety and comfort, at decreased rather than increased prices. We pin our faith on volume to achieve this objective." The necessary volume, he believes, is in the neighborhood of five million passenger cars for the industry. Any less will require a reconsideration of the prices recently announced.

Mechanics — Mechanically, new models have undergone changes, but significantly no increase in horsepower has been made. Chrysler has self-imposed an end to the horsepower race, but could give it the gun again anytime it prefers. A Firepower V-8 installed in a racing car develops 404 hp. Chrysler probably will talk about torque this year in advertising as a more important measure of engine performance than horsepower. From an engineering standpoint, probably the use of a 12-volt electrical system in the Crown Imperial is the greatest news. Reason for its adoption, with the resulting new generator, starter, coil, motors, lamp bulbs and wiring is for more positive spark plug operation. Fact that air conditioning will also be available later also has a bearing on the need for this six-cell battery system. Its use undoubtedly

(Material in this department is protected by copyright and its use in any form without permission is prohibited)

will spread to other series in the line when suppliers are better able to take care of requirements and servicing facilities become better acquainted with it.

Some Chrysler Prices Drop

The new Chryslers which came out last week have deluxe and standard versions which make direct price comparisons with 1952s impossible, but the V-8s are available at a lower figure and the sixes have been moderately increased. For one six the price is up 2.9 per cent. The Crown Imperial line, consisting of an eight-passenger sedan and limousine, have not yet been priced. This series, because of its 12-volt electrical system, will take on special price significance.

Primary highpoint of the new Chrysler is its styling which has caught up with other industry members without sacrifice to the interior dimensions which have long made Chrysler products noteworthy. The inch lower height is accentuated by a new body shaping which follows the front fender line through the door panels and the rear quarter panel to become the top line of the rear fenders. These, incidentally, are now integral parts of the body, the corporation abandoning bolt-on fenders.

The longer appearance for most models is an illusion obtained from the more spacious trunk. Wheelbase in the New Yorker, for example, is six inches shorter and the over-all length has been clipped by $2\frac{3}{4}$ inches. The Custom Imperial, a new series, is, however, almost six inches longer than its 1952 near-counterpart.

Packard Tries New Tack

The new team at Packard Motor Car Co. has not been sitting on its hands since it took over in May. President James J. Nance's conviction that it has to work to regain its prominence in the luxury car field has been no secret, but how this is to be attempted had not until last week been told.

Showing the 1953 models to the press, Mr. Nance gave the pitch. The Packard name will be reserved for its high priced line, which will be expanded to include such models as limousines and other luxurious models for the "carriage trade." The medium-price series, which in 1953 models will not be too much different in exterior appearance will be called the "Clipper," a name which has been dormant for several years. Packard will be shooting for a division of about one-third in the Packard series and two-thirds in the Clipper line. It will spend as much next year on advertising the Clipper as it has on the entire line this year.

The ambitious nature of Packard's plans is summed up by Mr. Nance when he says he'll be "terribly disappointed" if their production does not reach at least 125,000. That's almost double what 1952's output for the company will be. From a physical standpoint—not to mention sales—this goal would appear nearly out of the question. But some help will come from considerable Packard plant space being freed when its new jet engine plant is completed. There is the additional chance that it will call on some custom body builders to take on the load of the premium priced models.

Henny appears as a good bet for some of this. There seems to be definite limitations on how much additional Packard body business Briggs can entertain.

To strengthen Packard's position with suppliers has been a top-level job in recent months. Steelwise, says Mr. Nance, "We think we will have this problem licked." The dealer organization is undergoing a 25 per cent increase, too.

Clippers will range from $2500 to $3000, and Packards will go from there to $6900. In the Clipper line a couple of new models "to appeal frankly to younger people" will be brought out.

Auto, Truck Output

U. S. and Canada

	1952	1951
January	409,406	645,688
February	467,691	658,918
March	517,207	792,550
April	576,505	680,281
May	546,673	695,898
June	560,947	653,682
July	246,461	522,858
August	293,722	571,442
September	593,060	505,758
October	654,000*	558,971
November		480,199
December		402,729
Total		7,179,161

Week Ended	1952	1951
Sept. 27	142,893	113,973
Oct. 4	143,234	112,868
Oct. 11	138,035	120,543
Oct. 18	138,088	120,810
Oct. 25	145,057	121,215
Nov. 1	148,000*	118,743

Sources: Automotive Manufacturers Association, Ward's Automotive Reports. *Preliminary.

GMC Unfolds Suspension System

"Like floating on air" has long been the phrase used to describe a perfect ride. It becomes more than a simile in the new suspension system developed by GMC Truck & Coach Division. Bellows containing compressed air completely take the place of steel leaf springs in what the General Motors Division unimaginatively christened "air suspension ride."

The device's initial installation is on a new bus model, the PD 4104, a 41-passenger super-luxurious job for inter-city use. However, this is only the beginning. GMC people are not saying now that it is to become a fixture in their trucks as well, but many of the same advantages they claim for it in buses would be much desired by truck operators. And its application to other vehicles in the future is not inconceivable.

Principle and construction of the unit is simplicity itself. For each wheel there are two flexible air bellows of rubberized nylon tire fabric. The closed bottoms of these vertical and compressible bags are attached to a horizontal steel member on which the axle is hung. One is in front of the axle, the other behind. The open tops of these bags are attached to a horizontal rectangular sheet steel box which is rubber lined to make it leakproof. This box is attached to the vehicle's frame. Air can move freely from either bellows into the box. A feed air system supplied by the coach's compressed air tank is governed by a leveling valve which has its control arm attached to the axle. As more weight rests on an axle, more air is injected into the two steel boxes and four bellows which spring that axle, and air is bled off the system automatically as weight is removed from the axle.

IT'S BETTER TO USE THE BEST!

STANDARD STRUCTURAL ALLOY
BEARING QUALITY • ALLOY TOOL
SPECIALTY • NITRALLOY
CARBON TOOL
AIRCRAFT QUALITY

Hot Rolled •	Forged •	Annealed
Heat Treated •	Normalized •	Straightened
Cold Drawn •	Machine Turned •	Centerless Ground

sell your scrap

COPPERWELD STEEL COMPANY
WARREN, OHIO

176 W. Adams Street Chicago, Illinois	P. O. Box 1633 Tulsa, Oklahoma	117 Liberty Street New York, New York	803 Loew Building Syracuse, New York
3104 Smith Tower Seattle, Washington	325 W. 17th Street Los Angeles 15, California	1140 Lockwood Drive Houston 20, Texas	528 Fisher Building Detroit, Michigan
Monadnock Building San Francisco 5, Calif.	1578 Union Commerce Building Cleveland, Ohio	7251 General Motors Building Detroit, Michigan	

It's hard! It's tough! It's easy to machine! It's ideal for parts like these...

1. DIESEL INJECTION PUMPS
2. LATHE CENTERS
3. SLITTING ROLLS AND KNIVES
4. CAM ROLLERS FOR AUTOMOTIVE STEERING GEARS
5. MACHINE TOOL PARTS
6. PUMP PARTS
7. AIRCRAFT ENGINE PARTS
8. MECHANICAL SEALS
9. SAW MILL ROLLERS
10. BALL BEARINGS
11. ASBESTOS DISINTEGRATORS
12. MILL ROLLS

IT'S 52100!

ALL the parts you see listed above call for a steel that's hard, tough—yet easy to machine. And that steel is 52100—a high-carbon steel originally developed for ball bearings. It's now being used for a wide variety of machined parts where great strength and exceptional wear resistance are essential.

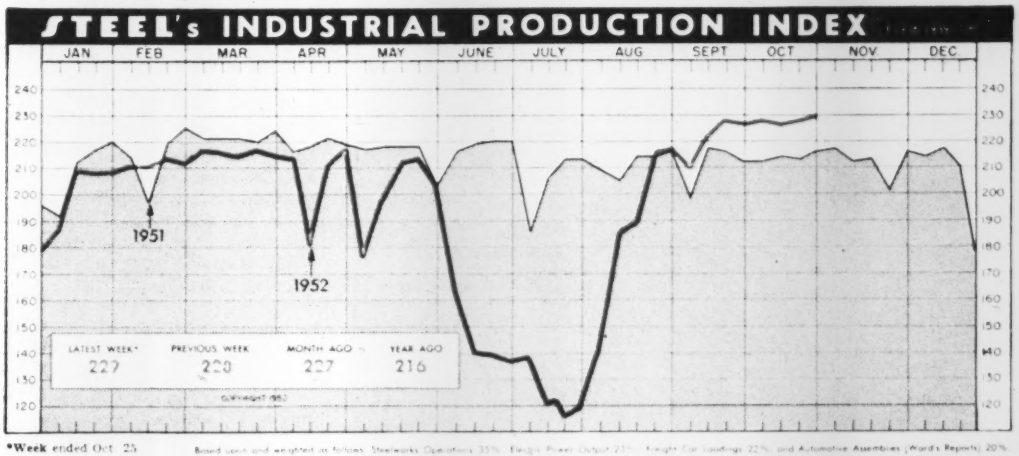
52100 alloy steel has high tensile strength and high fatigue strength. Its fully spheroidized structure makes machining easier. The 52100 steel produced by the Timken Company will withstand a working pressure of 200,000 p.s.i. It can be oil quenched to a maximum hardness of 65/66 Rockwell C.

One of the world's largest producers of 52100, the Timken Company is the only company that offers it in all three finished forms—bars, tubes and wire. And because of the Timken Company's rigid quality control at every step in production, you get uniform quality in every shipment. For small runs or emergency requirements, you can get 52100 tubing from the Timken Company's mill stock of 101 sizes ranging from 1" to 10½" O.D.

For a stock list of available sizes, grades and finishes, write The Timken Roller Bearing Company, Steel and Tube Div., Canton 6, O. Cable address: "TIMROSCO".

YEARS AHEAD—THROUGH EXPERIENCE AND RESEARCH

SPECIALISTS IN FINE ALLOY STEELS, GRAPHITIC TOOL STEELS AND SEAMLESS TUBING



*Week ended Oct. 25

Based upon and weighted as follows: Steelworks Operations 35%, Electric Power Output 23%, Freight Car Loadings 22%, and Automotive Assemblies (Ward's Reports) 20%.

Metalworking companies may scramble for production workers this winter as defense and civilian output expands. Industrial activity index continues on high plateau

RISING PRODUCTION among many metalworking companies may be checked soon by a severe shortage of manpower.

Skilled and semiskilled workers are becoming increasingly hard to find. This is particularly true in the automotive and appliance industries. Hog-tied by labor shortages, these manufacturers are putting the heat on their personnel staffs. Even unskilled workers are getting scarce in many cities. A glance at the Labor Department's monthly employment report tells why.

Jobs for All—Unemployment in September totaled only 1.4 million, or about 2 per cent of the nation's work force. This constitutes overemployment by almost anyone's standards. Manufacturing employment that month hit 16.3 million, the highest level since the end of World War II.

Most metalworking industries boosted their work force considerably, as steel mills reached new production peaks. Employment in construction and food industries remained high in September. But are other industries getting enough workers as these seasonal industries decline? Signs indicate they are not.

A Lean Winter—Many metalworking companies will apparently face a lean manpower supply this winter. Defense works and rising consumer demand may force manufacturers to scramble hard for workers.

At present, industrial activity is leveled off on a high plateau. STEEL's industrial production index during the week ended Oct. 25 edged up one point to 229 per cent of the 1936-1939 average. Automotive operations that week made a healthy spurt, but were offset by the dent made in freight car loadings by the soft coal walkout. Steel production remained at 105.5 per cent of rated capacity and electricity output rose slightly to 7696 million kilowatt-hours in the week ended Oct. 25.

Steel Production Levels Off . . .

After reaching a record 2,221,000 tons in the previous week, steel mills turned out 2,199,000 net tons of steel for ingots and castings in the week ended Nov. 1, the American Iron & Steel Institute estimates. Last week's production was only 4000 net tons over the corresponding week in September.

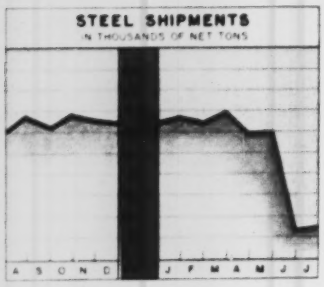
Auto Turnout Remains High . . .

Automotive companies are well on their way to new 1952 production records, despite the bite change-overs are taking. Reason for this is that automakers are using Saturday and even Sunday work, in addition to 9 and 10-hour weekday shifts. U. S. plants in the week ended Oct. 25 rolled out 136,335 passenger cars and trucks to surpass anything they've done in any of the previous eight weeks. Completion of production facilities for '53 models should push weekly operations even higher.

Passenger car output by U. S. companies in the week ended Oct. 25 totaled 106,979 units, a substantial increase over the 90,136-unit production in the comparable week in 1951. Truck producers drove 29,356 units off assembly lines in the week ended Oct. 25, compared with 24,443 units in the corresponding week of 1951.

Machine Tool Orders Decline . . .

New orders for machine tools are apparently back on the downgrade after a sharp rise during the steel strike. The National Machine Tool Builders Association's index

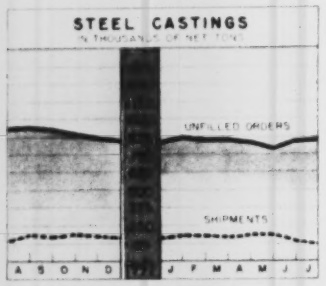


Steel Shipments

Net Tons

	1952	1951	1950
Jan	6,589,193	6,904,688	5,482,691
Feb	6,358,263	5,776,229	5,134,780
Mar	6,800,391	7,105,078	5,723,340
Apr	5,922,173	6,634,510	5,780,453
May	5,947,450	6,938,708	6,252,672
June	1,250,243	6,645,597	6,192,438
July	3,413,672	5,988,574	6,068,598
Aug		6,755,569	6,326,464
Sept		6,207,491	6,143,504
Oct		6,844,093	6,503,531
Nov		6,509,048	6,051,145
Dec		6,411,106	6,432,776

American Iron & Steel Institute

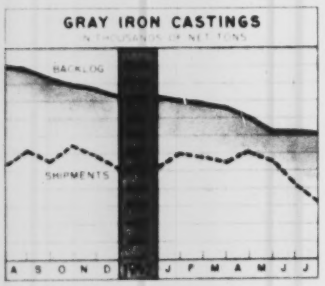


Steel Castings

Thousands of Net Tons

	Shipments		Unfilled Orders*	
	1952	1951	1952	1951
Jan	183.7	174.1	869.3	675.4
Feb	174.6	164.0	856.9	707.4
Mar	173.7	190.7	857.1	779.7
Apr	175.1	181.5	843.0	816.9
May	173.6	189.2	804.7	881.7
June	141.6	184.7	816.5	895.1
July	120.0	147.2	850.0	930.0
Aug		177.1		944.2
Sept		160.7		918.0
Oct		149.9		891.5
Nov		176.7		865.0
Dec		165.1		846.4
Total		2,090.3		

* For sale U. S. Bureau of the Census

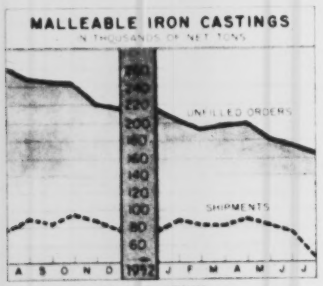


Gray Iron Castings

Thousands of Net Tons

	Shipments		Backlogs*	
	1952	1951	1952	1951
Jan	1,199	1,364	1,801	2,295
Feb	1,455	1,234	1,766	2,392
Mar	1,372	1,440	1,711	2,390
Apr	1,265	1,363	1,614	2,347
May	1,101	1,396	1,459	2,229
June	824	1,309	1,445	2,162
July	656	1,029	1,410	2,048
Aug		1,219		2,145
Sept		1,115		2,055
Oct		1,302		1,983
Nov		1,184		1,934
Dec		1,032		1,847
Total		13,768		

* For sale U. S. Bureau of the Census



Malleable Iron Castings

Thousands of Net Tons

	Shipments		Unfilled Orders*	
	1952	1951	1952	1951
Jan	87.0	92.5	203	234
Feb	82.9	86.0	193.1	255
Mar	81.0	101.7	196.9	267
Apr	89.3	97.3	198.2	276
May	81.8	100.8	189.4	275
June	74.4	93.7	173.4	256
July	45.3	76.8	166.6	263
Aug		90.7		249
Sept		82.3		245
Oct		93.9		238
Nov		88.2		221
Dec		76.0		215
Total		1,082.9		

* For sale U. S. Bureau of the Census

Charts copyright 1952, STEEL

Issue Dates on other FACTS and FIGURES Published by STEEL

Construction	Oct. 20	Gear Sales	Sept. 15	Ranges, Elec.	Sept. 29
Durable Goods	Oct. 22	Indus. Production	Sept. 15	Ranges, Gas	Oct. 13
Employ. Metalwkg.	Oct. 27	Ironers	Oct. 6	Refrigerators	Sept. 29
Employ., Steel	Apr. 28	Machine Tools	Oct. 6	Steel Forgings	Oct. 20
Fab. Struc. Steel	Oct. 27	Pumps	Oct. 13	Vacuum Cleaners	Oct. 6
Foundry Equip.	Oct. 27	Prices, Consumer	Oct. 20	Wages, Metalwkg.	Sept. 8
Freight Cars	Oct. 27	Prices, Wholesale	Oct. 20	Washers	Oct. 13
Furnaces	Sept. 29	Radio, TV	Oct. 6	Water Heaters	Oct. 13

for new orders in September declined 8.8 points to 300.3 per cent of the 1945-1947 average. This marks a large decline from the postwar peak when the index hit 615.3 per cent in February, 1951. The association says September shipments soared to 366.8 per cent of the 1945-1947 average, compared with 314.8 per cent in August. Orders from foreign buyers inched up in September, but were only 23.3 per cent of the 1945-1947 average.

Machine tool builders in September had a 12-month backlog of orders, compared with a 23-month backlog in September, 1951.

Retail Sales Climb . . .

Sales of retail stores rose sharply in September, reports the Commerce Department. They reached $14 billion that month, a tall $917 million over September, 1951. Sales of durable goods stores rose $490 million over the comparable 1951 month, while retailers of soft goods in September rang up $427 million more.

As passenger cars and appliances moved into showrooms following the steel strike's close, customers snapped them up. Sales of autos rose $340 million over last year and furniture-appliances sales reached $51 million over sales in September, 1951.

Mortalities at 3-Year Low . . .

Business failures plunged to the lowest level in three years during September. Casualties were only 539 that month, down 9 per cent from August and 13 per cent under failures in September, 1951, says Dun & Bradstreet.

Contrary to the downtrend in number, liabilities rose about 20 per cent in September to $20.1 million. While losses did not equal the post war peak of September, 1951, they were about even with 1948 and 1949.

Vacuum Sales Sweep Upward...

As demand rises for most civilian appliances, makers of vacuum cleaners happily find their products are no exception. Factory sales of standard-size vacuum cleaners in September rose 6 per

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Output (per cent of capacity)[2]	105.5	105.5	103.0
Electric Power Distributed (million kwhr)	7,696	7,681	7,234
Bituminous Coal Output (daily av.—1000 tons)	1,387	1,508	1,904
Petroleum Production (daily av.—1000 bbl)	6,500[3]	6,527	6,340
Construction Volume (ENR—millions)	$260.3	$333.3	$189.1
Automobile, Truck Output (Ward's—units)	145,057	138,088	121,215
TRADE			
Freight Car Loadings (unit—1000 cars)	800[3]	839	864
Business Failures (Dun & Bradstreet, number)	150[3]	139	155
Currency in Circulation (millions)[4]	$29,511	$29,617	$28,301
Dept. Store Sales (changes from year ago)[3]	+6%	+7%	+5%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$20,477	$14,951	$17,004
Federal Gross Debt (billions)	$264.8	$264.8	$258.3
Bond Volume, NYSE (millions)	$14.9	$14.2	$16.2
Stocks Sales, NYSE (thousands of shares)	5,521	5,956	10,683
Loans and Investments (billions)[4]	$77.6	$77.4	$71.5
United States Gov't. Obligations Held (billions)[4]	$32.8	$33.1	$31.0
PRICES			
STEEL's Weighted Finished Steel Price Index[5]	181.31	181.31	171.92
STEEL's Nonferrous Metal Price Index[6]	212.6	217.2	234.9
All Commodities[7]	110.6	110.7	113.4
All Commodities Other Than Farm and Foods[7]	112.5	112.6	114.8

*Dates on request. [2]Preliminary. [3]Weekly capacities, net tons: 1951, 1,999,035; 1952, 2,077,040. [4]Federal Reserve Board. [5]Member banks, Federal Reserve System. [6]1935-1939=100. [7]1936-1939=100. [8]Bureau of Labor Statistics Index, 1947-1949=100.

cent over August and stood a good 13 per cent over sales in September, 1951, says Vacuum Cleaner Manufacturers' Association.

Sales of ironers and dryers also are on the increase. Factory sales of household ironers in September reached 22,492 units, up 36 per cent from August and a comfortable 22 per cent over the 18,300 ironers sold in the same month of last year, reports the American Home Laundry Manufacturers Association. Manufacturers sold 71,516 automatic tumbler dryers in September, a rise of 34 per cent over August, and a whopping 63 per cent over sales in September, 1951.

Sales of washers in September, however, didn't surpass the year-ago volume. Factory sales of standard-size household washers totaled 283,732 units, 9 per cent under September, 1951.

Foundry Equipment Orders Lag...

Reflecting after-effects of the steel strike, makers of foundry equipment in September found their orders rising and production down. New orders for foundry equipment that month reached $1,684,000 in value, highest level since April, says the Foundry Equipment Manufacturers Association. Shipments of new equipment dipped to $1,581,000 in September from $1,605,000 in August.

Trends Fore and Aft . . .

Loans to metalworking companies increased $137 million in the week ended Oct. 15. . . Shipments of automatic gas water heaters in September jumped 35 per cent over September of last year. . . "TV set sales next year may well top 1950's 6,160,000 units" — J. K. McDonough, general manager of the radio-TV division, Sylvania Electric Products Inc. . . . Job placements by public employment services reached a new high in September. . . Average retail prices dipped 0.2 per cent in September, but the decline is only temporary, predicts Labor Department officials. . . Contract awards for new construction dropped 15 per cent under the average 1952 week in the week ended Oct. 23 . . . "In practically all lines —production and service—business is at least equal to or better than last year"—Commerce Secretary Sawyer . . . Factory workers averaged $69.50 weekly in September . . . Sales volume of New York department stores in the week ended Oct. 18 rose 4 per cent over the comparable 1951 week. This is the first time in 27 weeks New York retail sales have risen above 1951.

PRECISION MADE

PHEOLL SCREWS BOLTS, NUTS and Special Fasteners...

[redacted]TIME

Pheoll Screws, Bolts, and Nuts are easier to start, easier to drive and easier to tighten — because they're accurately machined and threaded. These features cut your assembly time and cost.

[redacted]GTH

The grain structure and flow of metal obtained through cold heading and roll threading increases the structural strength of Pheoll Fasteners. Cold working improves thread bearing surfaces, providing greater area of contact for firmer grip. Greater strength reduces possibility of shearing, and time lost in subsequent removal and retapping.

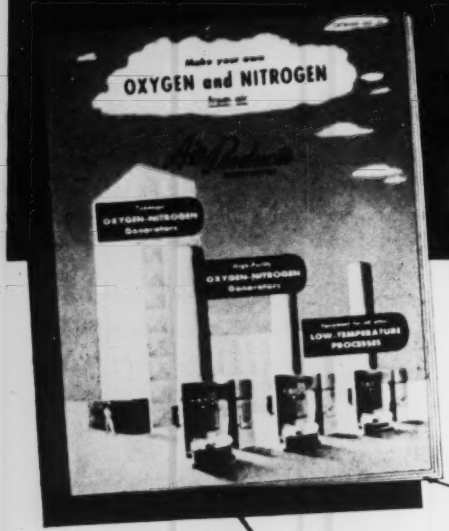
[redacted]CE

Step by step Pheoll inspection, through every process of production, assures uniform head size and shape; cleanly milled and recessed heads, neat chamfering and countersinking. All these factors contribute to the quality and finish which add materially to your product's final appearance. *Write* for Pheoll's product literature and price list.

THESE PHEOLL PRODUCTS INCREASE YOUR PRODUCTION RATE. Thumb Screws • Machine Screws† • Wood Screws† • Sheet Metal Screws† • Stove Bolts† • Rolled Threaded Wires and Studs • Special Rivets and Pins • Brass Washers

†Furnished in slotted and Phillips Recessed Head Types

PHEOLL SCREWS BOLTS



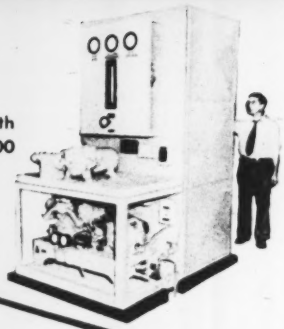
Cut Costs! NEW CATALOG

shows how you can make your own

OXYGEN, NITROGEN

High-Purity
OXYGEN-NITROGEN
Generators

14 standard models, with capacities from 300 to 12,000 cubic feet per hour



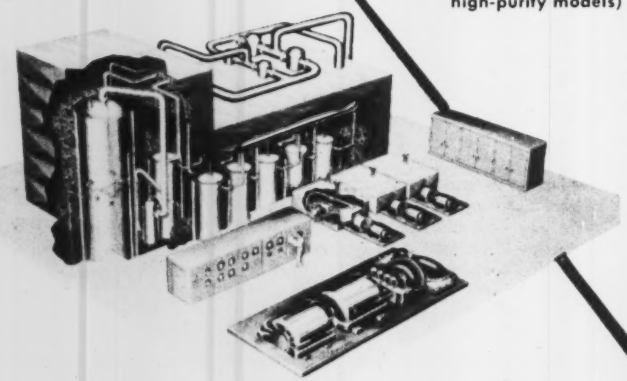
NEW!

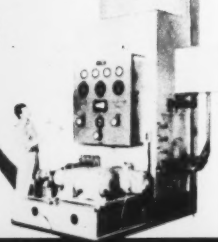
99.9% Pure OXYGEN
99.99% Pure NITROGEN

made *simultaneously* with ONE generator (specially adapted high-purity models)

Tonnage
OXYGEN-NITROGEN
Generators

9 standard models, with capacities from 25 to 500 tons of oxygen per day





Air Products
INCORPORATED

OXYGEN-NITROGEN-ARGON
GENERATORS

Specialists in Equipment for All Low-Temperature Processes

For your FREE COPY, fill out and mail

Air Products, Incorporated
Dept. N, Box 538, Allentown, Pa.

NAME.....TITLE.....
COMPANY.....
ADDRESS.....
CITY.....STATE.....

Men of Industry

A. G. PATTERSON
. . . president, Electric Controller

ROY A. NOBLE
. . . a sales supervisor at National Tube

DWIGHT RICHARDS
. . . eng. dir. at Oliver United Filters

A. G. Patterson was elected president of **Electric Controller & Mfg. Co.**, Cleveland, to succeed **R. G. Widdows**, named chairman of the board. **Dr. John D. Leitch** was elected vice president and chief engineer. **Keith C. Moore** was made treasurer and **Harold J. Rathbun**, secretary.

Joseph P. Somers was appointed assistant to the president of **Wyckoff Steel Co.**, Pittsburgh. He formerly was assistant to the vice president in charge of the company's eastern region in Philadelphia.

A. L. Fabens Jr. was made assistant general manager and production manager of **Ramset Division**, Cleveland, Olin Industries Inc.

Alloys & Products Inc., New York, elected **Andrew E. St. John** president to succeed the late **Henry Hecht. C. A. Hecht** becomes vice president and **Wilson Hecht** a member of the board of directors. In addition to his duties as president, Mr. St. John retains his post as treasurer.

R. W. Frederick was appointed Milwaukee district sales manager, **Bridgeport Brass Co.** He succeeds **Willson Bradley**, transferred to Chicago.

Roy A. Noble was appointed supervisor of extruded and stainless products sales for **National Tube Division**, Gary, Ind., U. S. Steel Co. For the last five years he has served as a district representative for tubing specialties in Detroit. Before that he was manager of commercial development at the Niagara Falls, N. Y., plant of Bell Aircraft Corp.

Lynn C. Davenport was elected vice president in charge of operations, **Mercer Tube & Mfg. Co.**, Sharon, Pa.

W. Morris Watterson was appointed supervisor of clad steel sales, **Lukens Steel Co.**, Coatesville, Pa. He has been acting supervisor since May, 1952, and succeeds the late **Wilbur A. Miller.**

Graver Tank & Mfg. Co. Inc., East Chicago, Ind., appointed **Harold C. Conners** assistant to the president. He served as chief engineer of the Sand Springs, Okla., plant.

Richard James III, formerly with Sylvania Electric Products Inc. at Philadelphia, has joined **Alloy Rods Co.** as sales representative with headquarters in Cleveland. He will cover Ohio, Michigan, Indiana and Kentucky.

Oliver United Filters Inc., New York, appointed **Dwight Richards** director of engineering. He has had many years of engineering-management experience in the field of heavy process and industrial machinery.

John G. Dun was appointed district chief metallurgist for **Republic Steel Corp.** at Warren, O., and **Walter M. Edwards** was advanced to superintendent of steel conservation and quality control. Mr. Dun succeeds **James J. Bowden**, resigned.

William O. Nussear Jr. was named sales promotion manager of **Superior Tube Co.**, Norristown, Pa. He was formerly advertising manager for the company and is succeeded by **Donald W. Titlow. Gerald H. Swavely** was transferred from the order and billing department to the sales department.

W. M. Mercer and **R. E. Jacoby** were appointed sales manager and chief engineer, respectively, of **Morris Machine Works** in Baldwinsville, N. Y.

R. J. Sigafoo was appointed chief engineer, bus division, **Flxible Co.**, Loudonville, O. He was formerly engineer of Twin Coach Co. and engineering assistant to the presi-

WHITFORD A. BALDWIN
Acme Steel Products dept. mgr.

EMERY B. KEREKES
asst. to V. P. at Hydropress

JAMES T. DUFFY Jr.
exec. V. P. of Camden Forge

dent. He recently joined Flxible to supervise engineering details of co-operative sales and manufacturing programs now in effect between Twin Coach and Flxible.

Whitford A. Baldwin, formerly district sales manager at Kansas City, Mo., was appointed manager of the Unit-Load Department of **Acme Steel Products Division**, Acme Steel Co., Chicago.

Douglas R. G. Williams was made staff assistant, manufacturing division, **Arma Corp.**, Brooklyn, N. Y., subsidiary of **American Bosch Corp.** He joins Arma after 10 years with Behr-Manning Corp. where he was assistant to the vice president in charge of engineering and manufacturing.

Emery B. Kerekes was named assistant to the vice president of **Hydropress Inc.** and its subsidiary, Loewy Construction Co., New York, builders of heavy hydraulic machinery and rolling mills.

H. L. Weinberg was made director of engineering for **American Locomotive Co.**, New York, in charge of product development and engineering in the locomotive division with headquarters at Schenectady, N. Y. He takes over the duties of **John Thomas** who is assigned to the vice president's administrative staff.

Newly appointed sales manager for **Pacific Airmotive Corp.'s** Seattle branch is **George F. Shaver.** He formerly was merchandise sales manager at the company's headquarters in Burbank, Calif.

James T. Duffy Jr. was elected executive vice president of **Camden Forge Co.**, Camden, N. J. He was formerly president of Riverside Metal Co. from which he resigned in April, 1952.

C. Robert Maranville, formerly assistant to the works manager of the Holyoke, Mass., plant of **Worthington Corp.**, Harrison, N. J., was elected assistant treasurer of the corporation.

Arnold E. W. Johnson, formerly director of engineering for **International Harvester Co.**, Chicago, was elected a vice president. **Harold B. Myers** was elected comptroller to succeed **Christian E. Jarchow**, who resigned that position to devote his time exclusively to his duties as executive vice president.

Thomas L. Fawick is chairman and chief executive officer and **Richard S. Huxtable** is president of the newly organized **Federal Fawwick Corp.**, a recent merger of **Fawick Airflex Co. Inc.**, Cleveland, and Federal Motor Truck Co., Detroit. Executive offices have been established in Cleveland with operating divisions in both cities. Mr. Fawick was founder and president of Fawick Airflex and Mr. Huxtable was executive vice president. The latter continues as general manager of the Cleveland division. **George H. Hammond**, former president of Federal Motor Truck, is executive vice president of the new corporation and continues as general manager of the Detroit division.

Lt. Gen. Edmund B. Gregory USA (ret.), was elected a director of **F. L. Jacobs Co.**, Detroit.

F. P. Murken was appointed manager, industrial hose division, **Quaker Rubber Corp.**, Philadelphia.

Donald K. Bice was appointed sales manager, **Biltmore Products Co.**, an associate company of Hankison Corp., Pittsburgh.

Officers of **Central Automatic Heating & Plumbing Co. Inc.**, formerly known as Radiant Heat Inc. of Lansdale, Pa., now a subsidiary of Central Automatic Sprinkler Co., are: **Leroy M. Lewis Sr.**, president and treasurer; **Leroy M. Lewis Jr.**, executive vice president and assistant treasurer; **Walter G. Liebert**, vice president and manager, heating and air conditioning department; and **Robert G. Wheeler**, secretary.

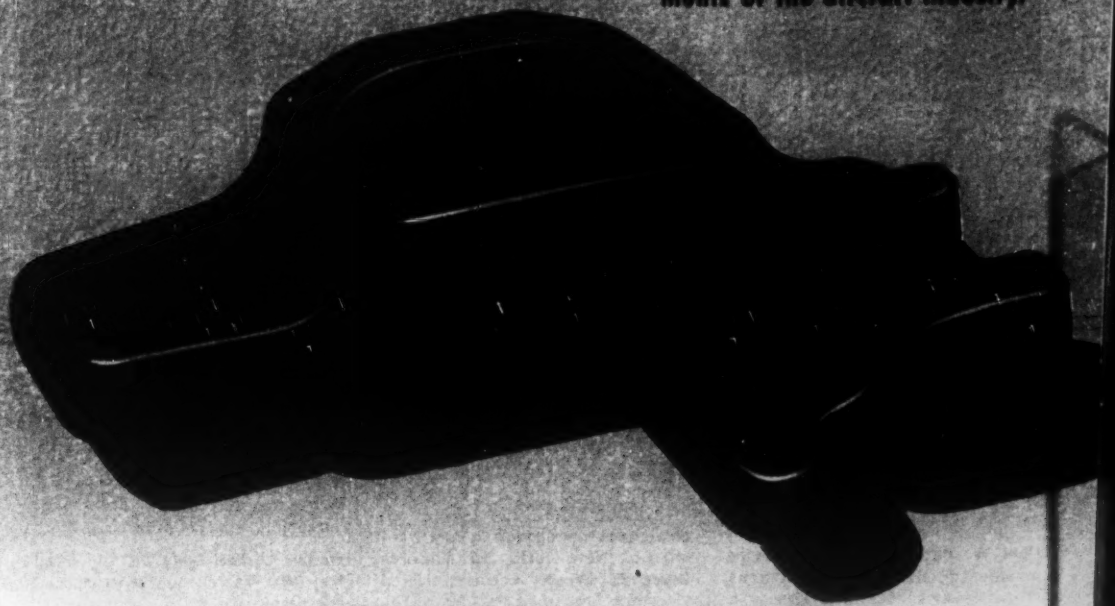
Thomas E. Moffit was appointed western manager, **Hooker Electrochemical Co.**, Niagara Falls, N. Y., to serve as senior executive for all Hooker activities on the West Coast, including British Columbia. He was works manager at the Tacoma, Wash., plant since October, 1951. **Horace W. Hooker Jr.** was appointed western plant manager succeeding **Albert H. Hooker** who is on an extended leave of absence.

Emil Holzwart was appointed production manager, **General Box Co.**,

TRANSUE FORGINGS

USUALLY COST LESS AT THE POINT OF ASSEMBLY

Aircraft forging weighs 29 lbs. This forging is typical of T & W ability to produce the exacting requirements of the aircraft industry.



Consult our engineers when you are contemplating conversion to forgings or when you are in need of reliable forging service.

TRANSUE & WILLIAMS

STEEL FORGING CORPORATION • ALLIANCE, OHIO

SALES OFFICES: NEW YORK • PHILADELPHIA • CHICAGO • INDIANAPOLIS • DETROIT • CLEVELAND

OVER 50 YEARS OF FORGING PRODUCTION EXPERIENCE

HOWARD J. EVANS
chief engr. Rockwell Mfg. div.

M. R. BRICE
. . . div. mgr. at Cutler-Hammer

ANDREW L. PONTIUS
. . . Shakeproof works mgr.

Des Plaines, Ill., to succeed the late **D. F. Hahn.**

Rockwell Mfg. Co., Pittsburgh, appointed **Howard J. Evans** chief engineer and **Robert J. Sarraf** chief chemical engineer of its meter and valve division. Mr. Evans continues as chief engineer for gas products and will be assisted by **Richard F. McCormick**, chief products engineer for gasoline and oil products; **Bernard Last**, development engineer on lubricant accessories; and **W. S. McLay**, chief draftsman. In his new position Mr. Sarraf is assisted by **L. M. Van der Pyl**, chief chemist.

Dale W. Patrick was elected vice president in charge of sales, Colona Mfg. Division, **Pittsburgh Screw & Bolt Corp.**, Pittsburgh.

M. R. Brice was appointed division manager, industrial control sales, **Cutler-Hammer Inc.**, Milwaukee.

H. C. Cranfill was promoted to assistant to the vice president-operations, **Columbia-Geneva Steel Division**, U. S. Steel Co., San Francisco. He succeeds **R. B. Freeman**, transferred to the foundry at Pittsburg, Calif., as project manager for the rehabilitation and operation of the plant under a U. S. government contract.

Richard S. Newlin was elected vice president in charge of mining operations for **Anaconda Copper Mining Co.**, New York. He succeeds **Clyde E. Weed**, recently elected vice president of operations of the company and its subsidiaries.

Andrew L. Pontius was appointed division works manager for **Shakeproof Division**, Illinois Tool Works, Chicago. He has been with A. B. Dick Co. as director of manufacturing.

At **Union Drawn Steel Division**, Massillon, O., Republic Steel Corp., **T. M. Girdler Jr.** was appointed to a newly created position of assistant manager of operations. Formerly superintendent of the Beaver Falls, Pa., plant of Union Drawn, he is replaced by **Horace B. Anderson. Harry B. Matzen Jr.** succeeds Mr. Anderson as assistant superintendent at Massillon.

Galion Allsteel Body Co. appointed **Ray W. Warren** southeast special representative with headquarters in Raleigh, N. C.

OBITUARIES . . .

C. L. Gougler, 62, president, **C. L. Gougler Machine Co.**, Kent, O., died Oct. 20 in Pasadena, Calif.

Fred W. Robinson, 57, president, **Detroit Oxygen & Acetylene Co.**, Detroit, died Oct. 20.

Charles A. Gurney, 49, founder and president, **Gurney Mfg. Co.**, Bloomfield, N. J., maker of screw machine parts, died Oct. 23. He formerly headed the screw machine department of General Electric Co. at Bloomfield.

John T. Robbins, 50, metallurgist and sales engineer, **Peter A. Frasse & Co. Inc.**, New York, died Oct. 18.

Frank Cordes, 82, former president and chairman of **Blaw-Knox Co.**, Pittsburgh, died Oct. 20. He retired in 1946. He also was president and general manager of Pittsburgh Steel Foundry Corp., Glassport, Pa.

Nicodemus J. Henning, 53, sales manager, **Illinois Malleable Iron Co.**, Chicago, died Oct. 21.

Irwin E. Sanger, assistant treasurer and purchasing agent for **Strong Steel Foundry Co.**, Buffalo, died Oct. 18.

Thomas N. Adlam, vice president and general manager, **Sarco Mfg. Co. Inc.**, New York, died Oct. 22.

Harry Dobrin, 68, president of **Furnace Engineers Inc.**, Pittsburgh, died Oct. 25.

Frederick Windsor, 79, founder and president, **Standard Foundry & Supply Co. Ltd.**, Windsor, Ont., died Oct. 24.

Harry D. Siegfried, 62, former manager of sales in the steel division of **Henry Disston & Sons Inc.**, Philadelphia, died Oct. 22. He retired last April.

How to boost foundry production

Consult Osborn Osborn's sales engineers are factory trained to analyze all types of molding and core blowing production requirements. As foundry specialists, they spend all of their time on foundry molding methods and machine applications. From Osborn's complete line of molding machines and core blowers, they can recommend impartially the type of machinery best suited for your needs.

Why not investigate further. Learn what advanced developments are being made to reduce your foundry costs with modern methods and machinery.

Call or write *The Osborn Manufacturing Company, Dept. 881, 5401 Hamilton Avenue, Cleveland 14, Ohio.*

Serving the Foundry Industry for Over 60 Years

Osborn Molding Machines

MOLDING MACHINES . . . CORE BLOWERS . . . INDUSTRIAL BRUSHES

Hundreds of Applications *prove*

RELIANCE SNAP RINGS

Reduce costs by saving material— machine time, and labor.

These three big factors in your manufacturing cost picture—material, machine time and labor—can be materially reduced by checking into RELIANCE RINGS when you design shaft assemblies, bearing applications or counterbores. By the simple expedient of machining grooves in your shaft (instead of machining the entire shaft), Reliance Rings snap into place to serve as shoulders for properly locking bearings or gears in position. In the same manner, you eliminate counterboring to form internal shoulders. To meet every need, Reliance Rings are available in all sizes, and manufactured from carbon, alloy, stainless steel and non-ferrous metals. Write today for your free copy of Engineering Folder 48-4 that gives you complete engineering details on Reliance Rings.

"THERE'S A RELIANCE RING FOR EVERY APPLICATION"

EATON

MANUFACTURING COMPANY, RELIANCE DIVISION

OFFICE AND PLANTS • MASSILLON, OHIO

SALES OFFICES NEW YORK • CLEVELAND • DETROIT • CHICAGO • ST LOUIS
SAN FRANCISCO • MONTREAL

Production AND Engineering
NEWS AT A GLANCE

ORE TRUCKS GROW BIGGER—If current tests are successful heavier trucks will be transporting iron ore on the Minnesota ranges. Under test now are three experimental 50-ton trucks, two with 550-hp of butane and one with 600-hp of diesel power. During the recent Metal and Nonmetallic Mineral Mining Convention recently, Charles A. Lindberg, supervisor of truck maintenance for Oliver Iron Mining Division of U. S. Steel Co., revealed that over 1400 truck units were required in Minnesota in 1951 to move 77½ per cent of the 231 million tons of iron ore and stripping for that year. Present truck sizes range up to 35-ton units with about 400-hp in one or two diesel engines.

GUNSIGHTS TO ADDING MACHINES—A new miniature air conditioning system, developed particularly to eliminate fogging, freezing and dirt-infiltration of aircraft gunsights, may soon be cleaning air and overcoming humidity problems in adding machines, time clocks, instrument storage cabinets, small electro-mechanical systems and electronic devices. Developed by Daco Machine & Tool Co., Brooklyn, N. Y., the desiccating device does the complete job of breathing, filtering and dehumidifying all air entering the gunsight. Developmental work on new models for commercial purposes already is under way.

SOUND DOES THE CLEANING—Removing oil, chips, dirt, lapping compound and other contaminants from surfaces of small precision workpieces is a natural for high-frequency sound waves operating in liquid. The method is especially effective on small precision parts, removing foreign substances even in remotely inaccessible locations. Job is done by beaming the sound waves through a cleaning solvent or detergent solution. One company uses just plain soapy water for its purposes. p. 92

PLASTIC ADDS STRENGTH—A new plastic is now being used to stiffen aircraft structural parts. Developed by Lockheed Aircraft Corp., Burbank, Calif., it can be poured like molasses into the cavities of complex parts. Lockheed's chief engineer, Clarence L. Johnson, says the product is a foam type material that changes from liquid to solid. Its strength and lightness contribute greatly to improved maneuverability and high speeds of aircraft. The plastic also can be used for packaging insulation, crash helmets, fireproof doors and life belts.

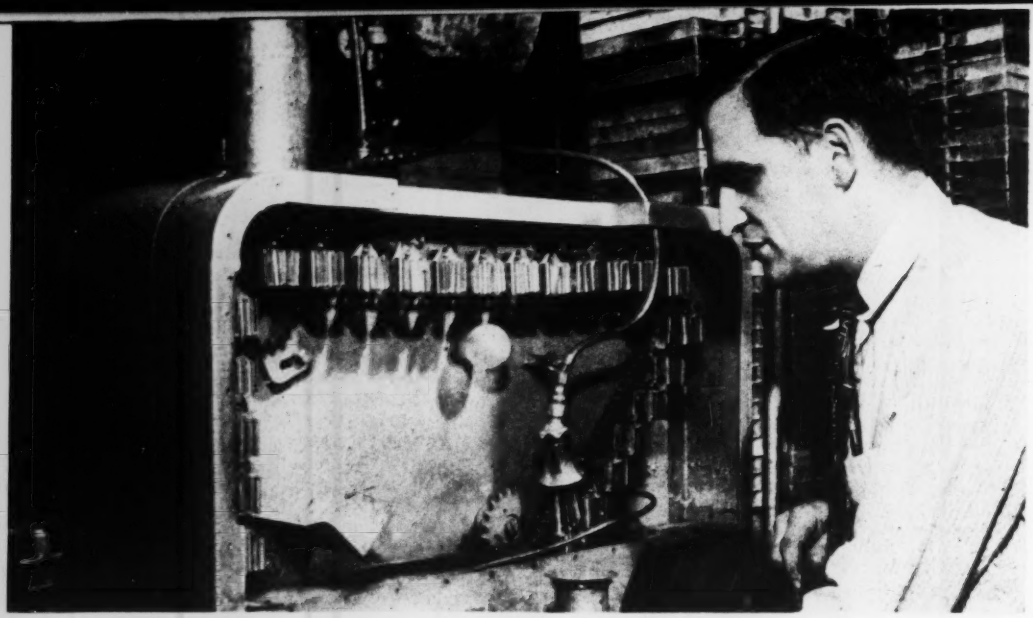
HARDNESS THE STUMBLING BLOCK—Meeting in San Francisco recently, service and industry representatives reviewed proposals for changes to military spec H-6875 covering steel heat treatment. Agreement was reached on practically the entire proposal with one major exception, Aircraft Industries Association of America, reports. While the services accept the concept of a test for adequacy of quench, they cannot agree on the hardness values proposed by industry, which would allow as little as 50 per cent martensite in the as-quenched condition. A compromise between the 95 per cent martensite requirement and the 50 per cent proposal is to be developed.

NEW AGE, MORE PROBLEMS—Heat is the one factor compounding problems in the metallurgists' battle to find the metals demanded by the Jetomic age. It's giving researchers cause for plenty of cranial activity in coming up with even a single high temperature metal that will meet a good portion of the requirements. The latter are so many that no one metal thus far can do a decent job—not without working out a reasonable compromise. One answer may be ceramics since main shortcomings of metals are lack of resistance to oxidation and chemical attack at high temperatures. p. 98

PRIMER DROPS FINISHING COSTS—Traditional bugaboos of all vinyl coating applications—the high cost of surface preparation and the problem of their adhesion to metal are licked by a new heavy-duty primer developed by Prufcoat Laboratories, New York. The development, besides making it possible to apply vinyls after drying overnight, successfully inhibits corrosion, even when surfaces are given routine preparation like wire brushing. Since the primer also acts as a good bonding agent for both conventional paints and synthetic resin coatings, it's a boon to plants working with both vinyl and conventional finishes.

CRITICAL METALS: SAVINGS GROW—Aircraft engineers recently developed a procedure that makes it possible, in some jet parts, to reduce requirements for cobalt by about 70 per cent, reports *Planes*. The publication says new specifications also have been written for boron steels which eventually should permit large savings in nickel, chromium and molybdenum. Currently titanium is being listed in new alloys which will reduce further the need for columbium.

METALWORKINGS—Network of roller conveyors at Brown & Sharpe is cutting manufacturing costs about 30 per cent (p. 94). Close scheduling is one of the secrets . . . . Factor holding down size of tool steel bars—carbide concentrations in the center of the steel. By dispersing the brittle areas, high-speed steel now comes bigger (p. 96) . . . . Use of a triple-edge, off-center carbide drill head in piercing 30-foot oil well drill collars (p. 105) is saving about 10 to 12 hours in the operation. Job is done in 2 hours . . . . Automaticity is paying off on continuous mills (p. 106). More tonnage is rolled by regulating main and auxiliary mill drive systems automatically . . . . Harnischfeger's answer to obtain free yard movement for towering booms in its own yard was to build a gantry crane with a built-in power source (p. 115). Its span: 60 feet.



Guaranteeing a smooth shave, sound waves pitched so high they cannot be heard are directed through solvent to remove foreign matter from electric shavers

ULTRASONIC CLEANING

Pays Off for Small Parts

Removing oil, chips, dirt, lapping compound and other contaminants from surfaces of precision workpieces is a natural for high frequency sound waves operating in liquid

ULTRASONICS is the answer to cleaning small parts where highest standards must be met.

Here is a method of removing oil, grease, chips, dirt, lapping compound and other contaminants from the surface of small precision workpieces at a rate hitherto unattainable and to a degree of cleanliness that meets the most stringent requirements.

Here's How—Job is done by beaming a high-frequency sound wave through the cleaning solvent or detergent solution, as the case may be, to the surface of the submerged workpiece. The sound wave is generally in the 300 to 1000-kilocycle-per-second range. It is set up directly in the liquid cleaning bath by means of a vibrating quartz crystal. The crystal is driven by an electronic oscillator.

Among the first installations of ultrasonic cleaning was a unit built by General Electric for use at Schick Inc., Stamford, Conn.

Cleaning machine is a GE ultrasonic generator with the addition of suitable conveyor equipment. The cleaning process takes place within a cabinet housing the conveyor chain, drive motor, treating tank and electroacoustic transducer.

Inaudible But Effective—Motion of the crystal sets up the sound wave which passes through a window into the trichlorethylene flowing in the cleaning tank. Conveyor chain moves uniformly through the cleaning tank at a rate of about one foot per minute.

This cleaning machine is used solely for cleaning shaver heads. Heads consist of a thin steel wrapper, slotted and crimped to shape, and tack-welded to the baseblock. A series of grinding and lapping operations leads to the plating process, after which a finish lap is applied.

It is following the finish lap that a most careful cleaning operation is required, and it was here that ultrasonics offered the promise of eliminating the expensive hand brushing which for many years had been the only sure way of cleaning the heads.

Figures Speak — Results from the ultrasonic method have more than justified expectations. Overall cost of the final cleaning was cut some 50 per cent. Floor space

was saved. Most important, the cleaning is more effective. Slits, holes, and crevices are clean. There is evidence that oil is being removed from remotely inaccessible locations.

Such results were of interest to other manufacturers. Among them was the Fairchild Camera & Instrument Corp., Jamaica, Long Island.

Here the part in question was a small precision-wound rotary slidewire potentiometer, manufactured to extremely high standards for mechanical and electrical tolerance. Low electrical noise, in particular, is an essential requirement for this part. This can be met only when windings and wiper arms are completely free of extraneous matter.

Not Easy—Conventional cleaning methods that are entirely adequate for most purposes would on occasion pass over the minute particles of dust or dirt left clinging to these critical parts. Ultrasonics provided the answer to the problem of making the cleaning complete.

It is used on both the windings and on the housings before final assembly. At Fairchild, soapy water proved to be a satisfactory detergent medium in which the high frequency sound can operate.

Both Schick and Fairchild units are rated 500 watts gross power input. Application of a production-line cleaner of higher powered rating was made at the Erie, Pa., refrigerator unit manufacturing division of General Electric.

Here, the four quartz vibrators, each driven by its own rf power supply are lined up 12 inches apart in the floor of the cleaning tank. Workpieces are suspended from a conveyor chain in such a manner that the critical surfaces and tapped holes face downward toward the crystals.

The conveyor chain is driven by a Geneva-type indexing arrangement so that each workpiece is positioned over the center of each crystal for the maximum portion of the cycle time.

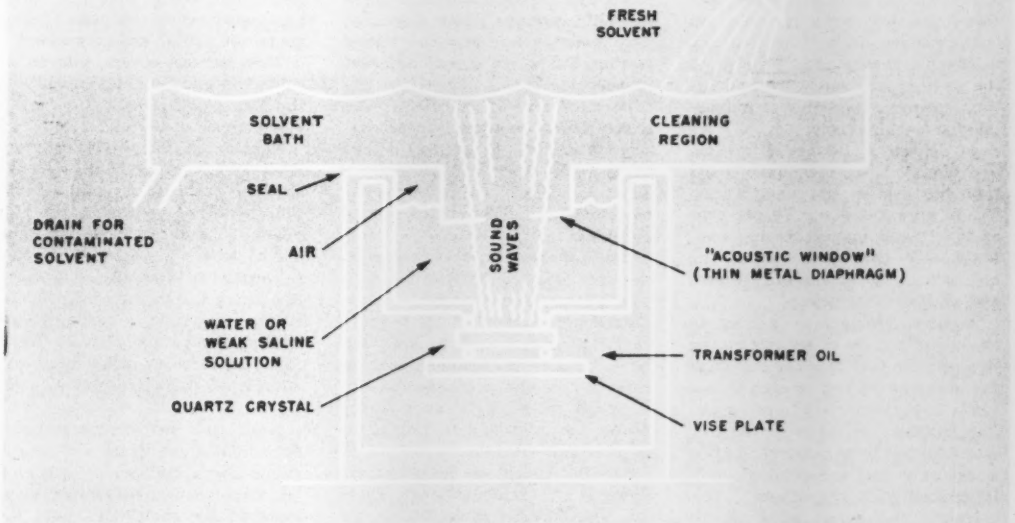
Limitations — Natural quartz crystals are limited to dimensions of a few inches. Ultrasonic generators of kilowatts rating must therefore utilize an array of crystals or else a ceramic or magnetostrictive transducer.

In discussing these limitations of ultrasonic cleaning George E. Henry, in charge of GE's industrial applications of ultrasonics, suggests that for some time to come ultrasonic cleaning would find its greatest field of usefulness in small parts manufacture.

Specialized Field — Relatively high installed cost of generating rf power, on the order of a dollar a watt or more, suggests further that ultrasonic cleaning will be justified mainly in the case of precision-built workpieces having a high intrinsic value per cubic inch and requiring a really thorough cleaning job.

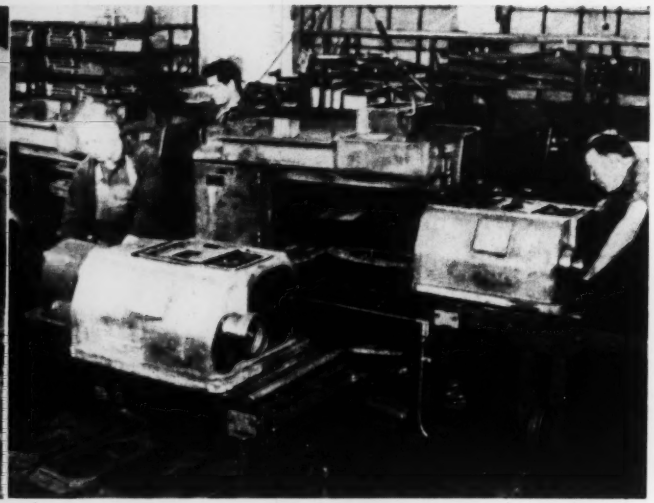
But within these limitations, superlative claims can be made for the new cleaning method. It is applicable to pieces of almost any material—to metals, glass, textiles, molded products—and to pieces of practically any conceivable shape. It might even be said more irregular the shape the better.

Ultrasonics is particularly good for getting at blind corners and capillary crevices.



Simplified view showing schematically components of accoustical portion of ultrasonic cleaning machine at Shick. Penetration far exceeds solvent alone

Bases at right, legs and tanks move along two parallel conveyor lines



Base, tank and leg are assembled into one unit. Motor, sprocket, chain and switches are already in the base

Conveyors Boost Machine Tool Production

With a linking network of roller conveyors, Brown & Sharpe has cut manufacturing costs by about 30 per cent. Close scheduling keeps steady flow of screw machines

AUTOMATIC and hand screw machines are now being produced on straight-flow lines. It's contrary to the old theory that because of the amount of hand work and fitting, conveyor assembly is unfeasible for machine tools.

At Brown & Sharpe Mfg. Co., Providence, R. I., they have found that the system not only works, but it works at about 70 per cent of the former manufacturing cost. Ultimately they will extend the methods to assembly of grinders and milling machines.

Another Problem — Adding to the complications of setting up the line was the fact that the buildings are multistoried and as such do not easily lend themselves to conveyor-line handling of large parts. This was whipped by making each floor a separate and independent unit, integrated with the others.

Here's the setup at B & S:

In building number 2, first floor, the conveyor lines for assembling bases and tanks consists of three assembly sections—base assembly, tank asembly line and the wiring section. Parts are stored adjacent to assembly lines.

Bench Work—In addition to the conveyor line sections, a bench assembly section is set up where subassembly work is done on parts which will then be transferred for machine installation on the assembly lines.

Bases go from a storage area to the conveyor line by a truck with a roller top. Truck holds two bases. Then on the assembly line bearing surfaces are cleaned, pipe fitting holes tapped, oil retainers, bearing caps and oil piping is assembled to the base. Oil piping is checked for proper assembly and feeding of oil to various bearings.

Shafts Added — Intermediate drive shaft, driving pulley shaft and spindle driving shaft-slow are assembled to the base. Next ratio change gear shafts, spindle driving shaft, fast and change gear shaft are assembled to the base. Change gears are fitted and assembled.

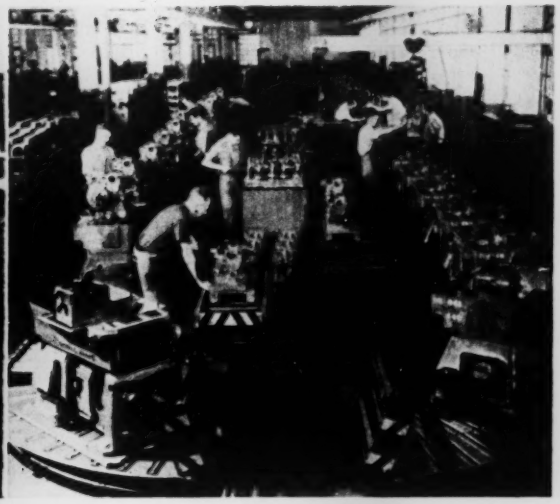
Then various covers, guards, oil collectors and brackets are put on the base. At this point the base is given final inspection.

The motor, motor sprocket and chain are assembled to the base and adjusted for proper chain tension. This operation completes the base assembly and the bases are now moved to the tank assembly line.

Semifinish Step One — In this line tanks and legs are moved from storage area to the conveyor line. Tank plates, drain plug, oil shield pins, pushbuttons, idler arms and all related parts are added to the tank.

Next the switch compartment door, insulation panel and related parts are assembled to the tank leg. Switches are added and placed loose in the tank. This part will be wired later and assembled by an electrician.

Subassembly work on the machine beds is done on the adjacent benches



The beds are joined to the base, tank and legs on this loop-type conveyor

Finally the base and leg are assembled to the tank. This completes the tank assembly and they are now ready to be moved to the wiring section.

Control Hook-Up — Two short conveyor lines make up the wiring lines. Units are hauled on a transfer car which connects with the end of tank assembly section.

On these two short lines the rigid conduits are assembled and all pushbuttons and control switches are connected. This completes the assembly on first floor and the units are removed for assembling and scraping on the second.

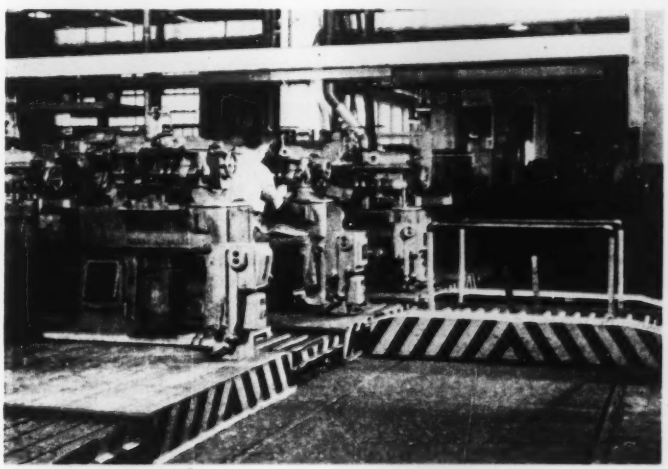
The second floor is divided into two sections. Assembling and scraping operations on the beds are done in one bay on moveable stands and conveyors. The assembling and erecting operations on the machines are done in another bay. These are performed on a floor-type loop conveyor. There is also a bench assembly section on this floor for subassembly work on the units.

Bed Assembly—Beds are delivered from a storage area for painting. Then scrapers move the stands to the scraping area where the cross slides and spindle housings are scraped. Stands go back to the bed conveyor for assembly operations.

When assembly is completed on the beds, they go to another line where they join the tanks and bases brought from first floor. This line is the machine assembling and erecting area. Here the machines get oilers, seals and shims put on. Pumps, pulley brackets and feed change gear boxes are added. Oil is put in the oilers and the machines are run until oil flows from all pipes. Inspectors check for proper flow.

Next slide levers, trip levers and deflectors are put on as are reversing levers, clutch forks, driving sleeve and clutch. After completion on this line the units are moved to the third floor of building 5 for turret slide scraping, spindle assembly and other final assembly operations, run-off and final inspection.

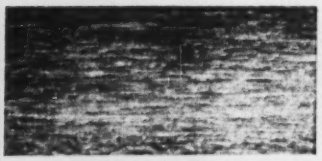
Operations were retimed, tightened up and parts supply arrangements improved. Result is a smooth production flow.

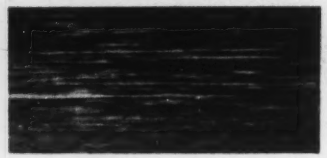


At this final inspection station the finished machines are given their final check before being routed to the cleaning station—then to stock

Ultrasonic tester tells the "inside story" of the metal under test. It reveals subsurface flaws and failures

Below—Samples of high speed steel rod show improved structure in segregate-free metal as in lower photo





Bigger Tool Steel Bars

. . . THE INSIDE STORY

Tendency for carbide concentrations in the center of tool steel bars has held down size produced. Now with the brittle areas dispersed, high speed steel comes bigger

By DAVID P. HUGHES
Metallurgist
Latrobe Steel Co.
Latrobe, Pa.

UNTIL RECENTLY large full-length bars of high speed steel have not been available to the trade because of their inherently poor center quality. This quality has been traced to carbide segregation.

Consequently large diameters of high speed steel have been furnished as individual upset forgings or at best bars extremely short in length.

The Safe Side—High speed steel bars or forgings have been made to a maximum weight of only 500 to 800 pounds, the steelmaker being wary of risking his reputation for quality on pieces weighing more than this.

After research on the cause of this limitation, Latrobe has overcome the size barrier of high speed steel and announces production of bars as large as 10 inches diameter, 10 feet long and weighing in excess of 2500 pounds. The bars are not only internally sound as determined by the ultrasonic reflectoscope test but are free from objectionable carbide segregation.

A Standout—To the production steel mill and those associated with low alloy tool steels, a single bar of steel weighing 2500 pounds is not a remarkable achievement, but to high speed steel users it represents an almost unbelievable piece of steel. What then makes this so outstanding?

In production of high alloy tool steels, and particularly high speed steel, the required additions of various alloying elements add considerably to the complexities of quality control throughout the entire manufacturing process. Such factors as proper chemical content, internal soundness, cleanliness, and control of surface conditions must be reckoned with.

Second Is Tougher—But these alloy additions have yet another potent influence on the quality of the steel and unfortunately one which is not as easily mastered as the foregoing problems. This powerful effect is carbide segregation. Just what is carbide segregation?

Alloying additions of chromium, vanadium, tungsten, and molybdenum together with the base metal iron combine with carbon to

form crystal like compounds called carbides. These individual carbides are extremely complex and varied in composition but all possess the properties of high hardness and extreme brittleness.

Essential — Metallurgists agree that properly dispersed free carbides are a necessary part of tool steel since they impart the abrasion resisting characteristics so necessary in today's metalworking industry.

However, in producing tool steel by the most commonly used and established methods, these carbides do not consistently remain well dispersed, but instead tend to coalesce at the center of the bar where they form brittle clusters. This is called carbide segregation. The greater the percentage of alloying elements and the larger the bar of steel, then the greater the amount of segregation normally expected, however deleterious it might be.

More Scrap—Segregation is a distinct disadvantage to the tool steel producer. Poor hot working properties of such material often leads to strain cracks, rolling ruptures, and forging bursts during forming, all of which if detected mean high manufacturing scrap losses.

Segregated material is even more undesirable to the tool and die maker and user. Segregation has an adverse effect on the physical properties of the steel and can cause poor machinability, distortion and nonuniform response to heat treatment, and reduced shock resistance.

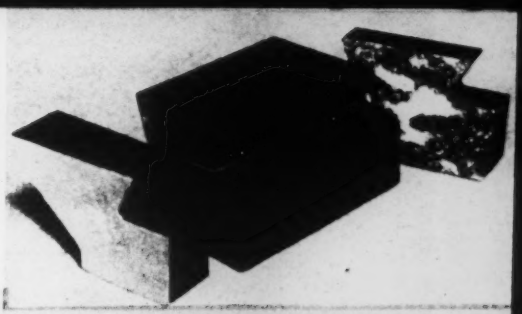
Caused by Clusters — For instance, a high speed steel dovetail form tool cracked in heat treatment. A metallurgical investigation disclosed that cracking was not attributable to faulty heat treatment, but to clusters of segregation located near the base of the dovetail section. Such a condition can readily promote cracking either in heat treatment or under normally applied stresses in use.

In an effort to determine if segregation produces a deleterious effect in small size bars of high alloy tool steel, where many times it seemingly is undetectable by standard testing means, samples roughly the size of a $\frac{3}{4}$-inch square ground tool bit were intentionally fractured under impact loading. Results of this test clearly indicate that segregated material possesses considerably reduced toughness characteristics throughout the entire tempering range even though it has been subjected to a great amount of hot working. Reduced toughness at the center section of thin, wide flat bars further confirms this effect.

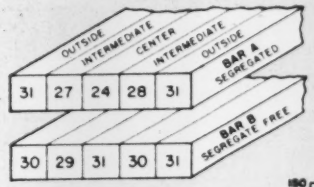
Control Factor—It therefore becomes apparent that if internal quality of high alloy steel bars is to be maintained whether the bar be small or large, some definite control of segregation must be maintained during manufacture. This has been worked out at Latrobe and it is now possible to manufacture bars in all commercial size ranges free from objectionable carbide segregation.

Results obtained through use of segregate free material are of great interest to the tool steel consumer. Unfortunately, many users of high alloy tool steel have lived with the problem of segregation unknowingly because they have not been aware of the advantages to be gained from using segregate free material. This condition should no longer exist.

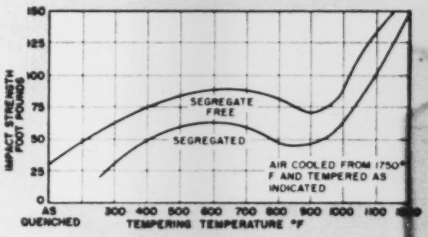
These then are the implications behind the production of the largest bar of high quality high speed steel. Since such bars have just been introduced, it is not possible to speculate as to all the uses of this type material. Certainly new fields of tooling opportunities will be opened which have been shackled by the unavailability of large size high quality bars. Such industries as those employing broaches, milling cutters, circular saws, gear and thread hobs, slab cutters, and in fact all types of cutting tools, will benefit by the fact that larger and better tools can be made from these large bars.



Schematic presentation of reason for cracking of high speed steel dovetail from tool. Left hand disk shows macro-segregation across entire section while the right hand disk shows segregation in failure area



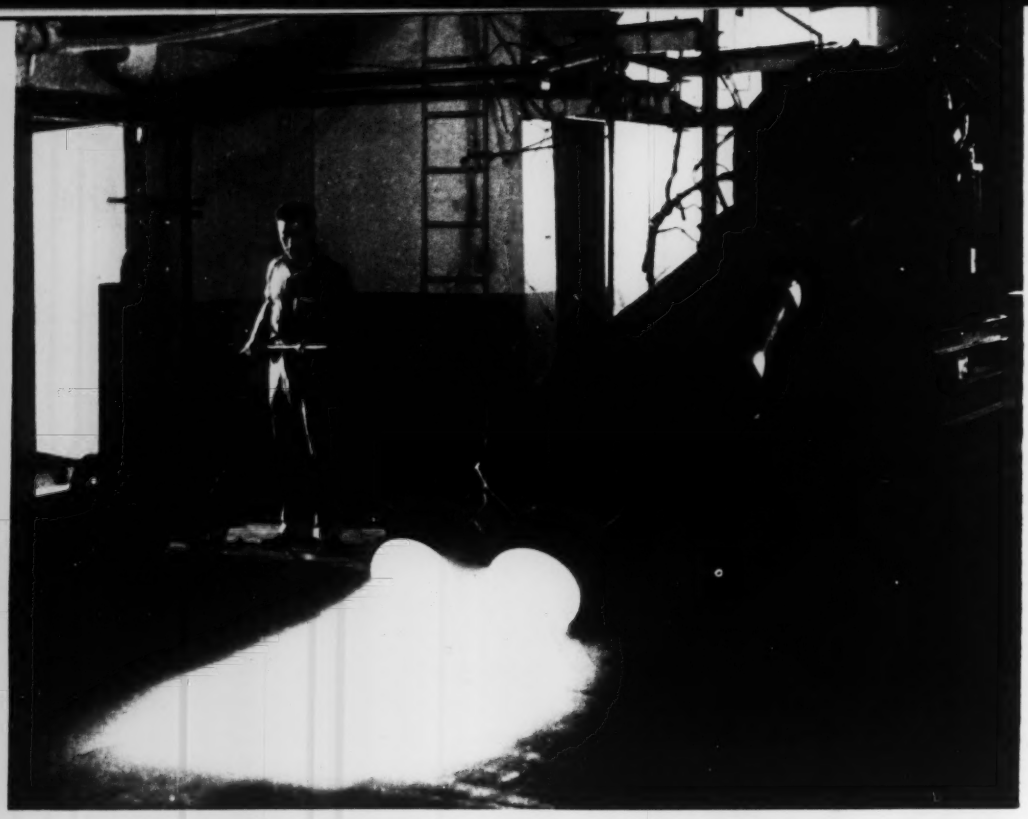
Left—Two bars of M-2 high speed steel were sectioned and izod unnotched impact strengths determined. Data shows bar with segregation has a weak center under shock. Units are foot pounds



Right—Comparison of unnotched izod impact strength of 1% carbon—5% chromium steel segregated vs segregate free

British Send Plain Grinder

Early delivery in the United States of the Churchill model BW 10x36-inch hydraulic plain grinding machine is reported by British Industries Corp., New York. The specially-designed machine will operate with equal efficiency on either traverse or plunge grinding, according to the distributor.



In a test conducted by the National Advisory Committee for Aeronautics this jet exhaust blasts to check its effect on aircraft carrier decks

High Temperature Metallurgy:

JETOMIC AGE DEMANDS IT

Demands for metals that will withstand ever higher operating temperatures keep the metallurgists continually straining at the braces. Here's a peek at their everyday problems

By BERNARD P. PLANNER
Metallurgist and Staff Consultant
James H. Knapp Co.
Los Angeles

BOILING DOWN the phases of most metallurgical research today we find they resolve themselves around the one word "heat." We live in a high-temperature age which places increased responsibilities upon the researchers to create superior heat-resistant materials for converting thermal energy into ordered kinetic energy.

This is especially true in the fields of jet engines, rockets and gas turbines.

Steady Climb—There has been a steady temperature increase from the 800° F to 1200° F range, which was satisfactory for highly stressed parts in 1930, to the jet engine and rocket requirements of today's high-temperature super-alloys with a range of from 1200 to 2000° F.

Two outstanding examples of successful high-temperature applications might be mentioned. One is the afterburner, which is an extra combustion unit located in the tailpipe behind a turbojet engine. Utilizing the unburned oxygen in the turbojet exhaust, this device gives needed short bursts of increased speed and climb for take-off and combat maneuvers.

Ceramic Coat—Other examples are the exhaust systems fitted to some radial aircraft engines. These structures must withstand withering vibration and temperatures running to 1800° F for continuous operation over extended periods. Ryan Aeronautical Co., San Diego, Calif., successfully coats these components with thin ceramic coat-

ings which substantially extend their useful life by protecting their surfaces against oxidation and corrosive attack.

When discussing super alloys, or materials for ultra high temperatures, it is important to distinguish between four different groups of materials: Metals and their alloys, ceramic coated metals, ceramic bodies and combinations of metals and ceramics, or cermets.

Too Much for One—Evaluation of properties which super-alloys should have for high-temperature applications merits consideration. They must have load-carrying ability at high temperatures, certain ductility and resistance to oxidation and corrosion by humidity, combustion gases, propellants, erosion and thermal shock. No one material will meet all of these requirements and a reasonable compromise will be necessary.

A conception of the specialized functions of high-temperature metals can be obtained when it is realized that a structural carbon steel, having a room temperature ultimate tensile strength of 140,000 psi would drop to 1000 psi after exposure to 1400° F for 1000 hours.

A Hooker—Metals are ductile and to a certain degree resistant to thermal shock. They have good thermal conductivity and are reasonably resistant to mechanical shock. Unfortunately, the metals with the highest melting points are not at all resistant to oxidation. Heated in air, they oxidize, decompose rapidly and burn within a very short time.

An example of this phenomenon is tungsten, the strongest of known metals, which has the highest melting point of any metal—6200° F. At room temperature its strength for a 1-mm wire is 200,000 psi. Incidentally, the temperature of a glowing lamp filament is 4500° F.

Needs Protection—But tungsten's affinity for oxygen is so great that it cannot be used, unprotected, for high-temperature applications. Other high melting point metals, such as molybdenum, columbium, zirconium and tantalum all have too much affinity for oxygen to be used without special protection in these applications.

Molybdenum's melting point is around 4800° F and its short-time strength at elevated temperatures runs between extremes of 40,000 psi at 1500° F to 26,000 psi at 2400° F. But it oxidizes rapidly in air above 1200° F and at 1800° F it evaporates through oxidation at the rate of from 0.020 to 0.050-inch per hour.

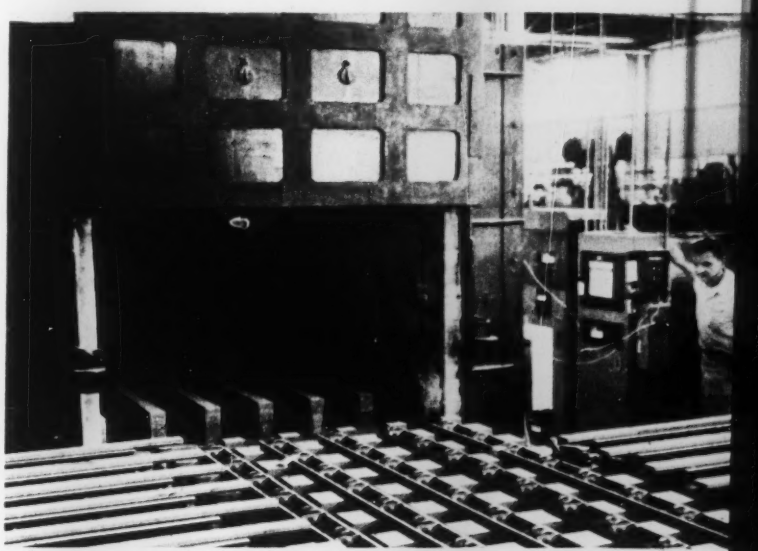
Molybdenum can be protected by surrounding it with helium or hydrogen or, recently, by coating it with mo-silicide precipitated on its surface from a gas phase. Protected molybdenum has been used for over 5000 hours in air at 1800° F and as long as 300 hours at 3100° F.

Two Classes—The large number of alloys developed and tried for high-temperature applications fall into two general classifications: Those which have a nickel base, and those with a cobalt base. The nickel-base alloys have a molybdenum content of from 16 to 30 per cent, tungsten from 3.75 to 5.25 per cent, iron from 4.5 to 7 per cent and the balance of nickel.

The cobalt-base alloys are useful in the 1400 to 1800° F range. Highest tensile strength of any metal among this group is 52,000 psi at 1600° F. Most of them show good resistance to scaling up to 2000° F. These alloys have been generously used in jet engines parts as rotating blades and in sheet metal components such as combustion chambers, transition liners, inner and outer exhaust cones, tailpipes and structures for rockets, ram-jets and pulse-jets.

Ceiling—About 1800° F seems to be the limit of applicability and usefulness for these alloys with present knowledge. It seems that further development must lead into the field of ceramics. The main shortcomings of metals are lack of resistance to oxidation and chemical attack at high temperatures. Ceramics, on the other hand, are extremely resistant to oxidation because they are saturated oxides of metals, and often are resistant to corrosion.

Ceramic coatings as a means of protecting metals from heat and corrosion have long been known—in cooking utensils, sinks and bathtubs. High-temperature applications in aircraft require more stringent specifications. Their thermal expansion coefficient over the temperature range contemplated must be as close as possible to that of the metal to which they are bonded. Coatings must also be



Here's one of the Knapp furnaces at Ryan Aeronautical Co., San Diego, Calif. It's used to bring the temperature of parts to as high as 2000° F

Large exhaust system for a 3500 hp Pratt & Whitney aircraft engine. The part is ceramic coated for protection against oxidation and corrosion

thin, to save weight. Resistance to thermal shock is another must.

Vapor Reaction—In addition to applying the ceramic by dipping or spraying, the most recent method is by vapor deposition. Volatile compounds, containing the coating elements are passed over the work pieces which are heated to a temperature above which components of the vapor react. In most cases, they decompose and are deposited to form the desired coating. Such coatings can prolong the life of coated parts at operating temperatures, permit their use at higher temperatures or allow use of lower alloy metals in the application.

A radical change in design is necessary if a ceramic body is substituted for a metal one. Ceramic bodies are nonductile and present problems where mechanical shock and stress concentrations are present. They have no definite melting point but deform gradually at elevated temperatures under stress.

Ingredients—Raw materials for manufacture of ceramic bodies include alumina, zirconia stabilized with lime or unstabilized, beryllium oxide, lime, magnesia, thoria, the carbides of titanium, silicon, boron, zirconium, carbon and graphite. This field is a highly confidential one in which these materials are used both singly and in mixtures.

Alumina is cheap, stable, pure and not affected by reducing conditions even at highest temperatures, but its melting point (2050° C) is lower than many refractories. Its thermal conductivity is high and it has no inversion points in its expansion curve.

Poor on Shock—Beryllia has a melting point of 2570° C, excellent resistance to thermal shock and high heat conductivity, but mechanical shock strength is inferior to alumina.

Zirconia, found in sands up to 97 per cent pure, presents great processing difficulties. It undergoes crystal inversions which cause large and abrupt volume changes, is very sensitive to thermal shock and melts at 2680° C.

Magnesia, a good insulator, melts at 2800° C, is stable under oxidizing conditions, but easily reduced in atmospheres above 2300° C. It has the highest coefficient of expansion of all refractories.

Takes Hot Firing—Thoria has the highest melting point (3050° C) and the greatest density of all ceramics. Manufacturing difficulties are encountered because of the high firing temperatures necessary for vitrification.

The carbides have high thermal conductivity, good thermal shock resistance and good hot strength but most of them are unstable at high temperatures.

Best of All—Carbon and graphite surpass all other materials in resistance to softening at elevated temperatures. Pure carbon has no melting point but sublimes at 3450° C while graphite melts at 3800° C. Both soften above 2000° C. Although their mechanical strength is low, their excellent resistance to oxidation and corrosion justify their use as guide vanes in rockets.

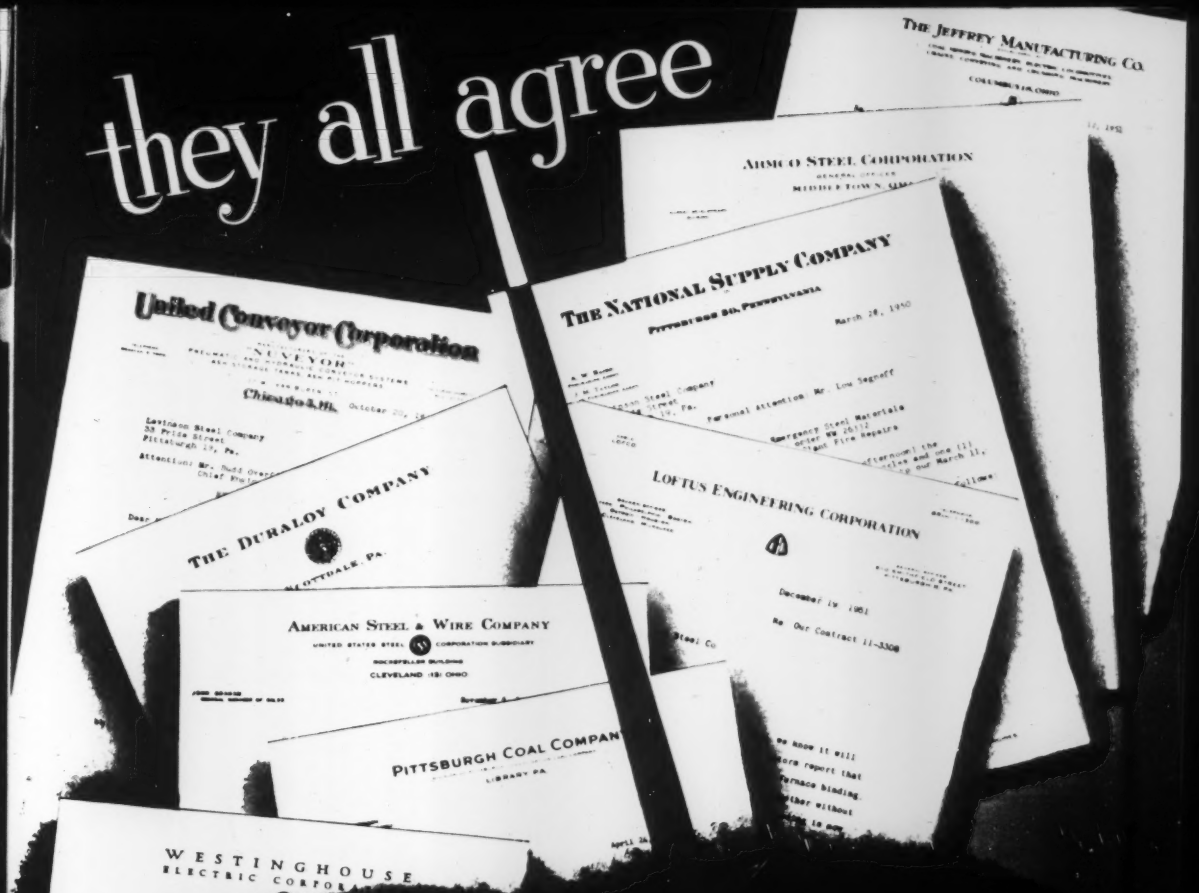
Most frequently used method in manufacturing these super-refractories is molding and hot pressing in graphite dies, but pressure is limited by the strength of the graphite, which is less than five tons per square inch. Die temperature is kept at 5400° F. Strength, thermal conductivity and corrosion resistance depend on porosity of the fired body and the properties approach a maximum as porosity approaches zero.

No one refractory has all of the properties necessary. Zirconium carbide is the strongest at 2200° F but its resistance to oxidation is poor. Boron carbide has the poorest thermal shock resistance. Titanium carbide has excellent resistance to thermal shock and good resistance to oxidation. Zirconium boride is capable of withstanding the highest temperatures and seems very promising.

Combinations Needed—As far as ceramic materials alone are concerned certain properties characteristic of metals cannot be obtained. This has led to the combining of metals and ceramics in the manufacture of metal-ceramics by powder metallurgy methods. The rather low thermal and mechanical shock resistances of ceramics can be expected to be improved by mixing refractory metal powders, such as tungsten or molybdenum, with their metalloidal type compounds, such as oxides, borides, carbides, and pressing and sintering them. In this process, the chemically resistant ceramic particles surround the ductile metal powder particles, thus giving the material ductility and resistance to high temperature and chemical attack.

Powder metallurgy has great potentialities in the development of heat resisting super alloys for extremely high temperature applications. However, use of such al-

they all agree


The Jeffrey Manufacturing Co.
Armco Steel Corporation
The National Supply Company
Pittsburgh 30, Pennsylvania
Unified Conveyor Corporation
The Duraloy Company
Loftus Engineering Corporation
American Steel & Wire Company
Pittsburgh Coal Company
Westinghouse
George J. Hagan Company
Industrial Furnaces for All Purposes
Pittsburgh 3, Penna.
Levinson Steel Co.
So. 20th at Wharton St.
Pittsburgh 3, Pa.
Gentlemen:
We have just received your shipp
on the five rotary furnace shells we have on
and wish to advise they meet our requirements.
we know from experience dating back many years
will get the fabricated steel shells out as pro
You may not realize it, but we credit th
acceptance by Industry of Hagan Rotary Furnaces not
on our proven design and reliability, but on your accur
fabrication and scheduled shipments.
Your company has supplied 90% of our rotary
furnace fabrications, each made according to our specifi-
cations, and always shipped on time! Naturally, it is
results like this that make dealing with you a pleasure.
Cordially,
GEORGE J. HAGAN COMPANY

Here are just a few letters of commendation from satisfied customers, all telling the same story . . .

Levinson delivers *on time* and *as specified*

The Levinson STEEL COMPANY

20TH & WHARTON STS., PITTSBURGH 3, PA.

Fabricators of Steel for Industry

loys will mean that we will have to change production methods. Forging and casting at the temperatures where the materials will eventually be used, and then expecting such materials to retain their shape and exact dimensions during use is, per se, a contradiction.

Only those materials can be expected to perform satisfactorily which have very high melting and boiling points and which soften at considerably higher temperatures than those at which the part will be used. Because of the unlimited number of combinations possible and because grain size, purity and inherent porosity can be better controlled, powder metallurgy techniques offer better possibilities for fabricating super-alloys than conventional manufacturing methods.

From a presentation to the Ryan Aeronautical Co., San Diego, Calif.

Automation for Idler Arms

Automatic transfer mechanisms between stations steps up the production of tank idler arms to 6½ pieces per hour, reports Cross Co., Detroit, builders of the new Transfer-matic.

Machine has six stations one for loading and five for machining the cast armor parts with Rockwell hardness 36. Operations include core-drilling and reaming the small hole and hollow milling the boss around the small hole; rough and semifinish boring the large hole and trepanning the groove on one end.

Trailer Carries Foil Story

New ways of packaging industrial products of all types with aluminum foil will be shown to a nationwide audience from a new mobile display and demonstration trailer designed and equipped by the Reynolds Metals Co., Louisville, Ky. The all-aluminum semitrailer is now on its first tour of the country.

Technicians give a demonstration and explanation of the protective, automatic packaging, and "self salesmanship" features of a wide variety of aluminum foil packaging materials. Type of foil materials described are intimate wraps, pouches, folding cartons, corrugated cartons, fiber canisters and overwraps.

Foundry Tries New Sand Dryer

The first reclamation system for foundry sand featuring a vertical sand dryer without moving parts is in operation in the Buffalo plant of Worthington Corp. Manufactured by Hydro-Blast Corp., Chicago, the new system reclaims up to 5 tons of sand per hour.

Difficult maintenance problems with the many complicated moving parts of previous drying towers are not present in this system. After passing through an elaborate washing and classifying process, the sand is elevated to the top of the drying tower. It falls naturally through the tower, passing slowly through a series of hot air ducts which have been built in rows through the complete height of the dryer. By the time the sand reaches the bottom, it is clean and dry.

Because a long drying period is no longer necessary, the Worthington foundry requires less surplus sand in storage. The new system also reduces foundry dust and frees valuable plant floor and storage space for other purposes.

Submerged arc manual welding head depositing bead on outside butt weld. Angles are placed back to back to maintain line with the welder truck

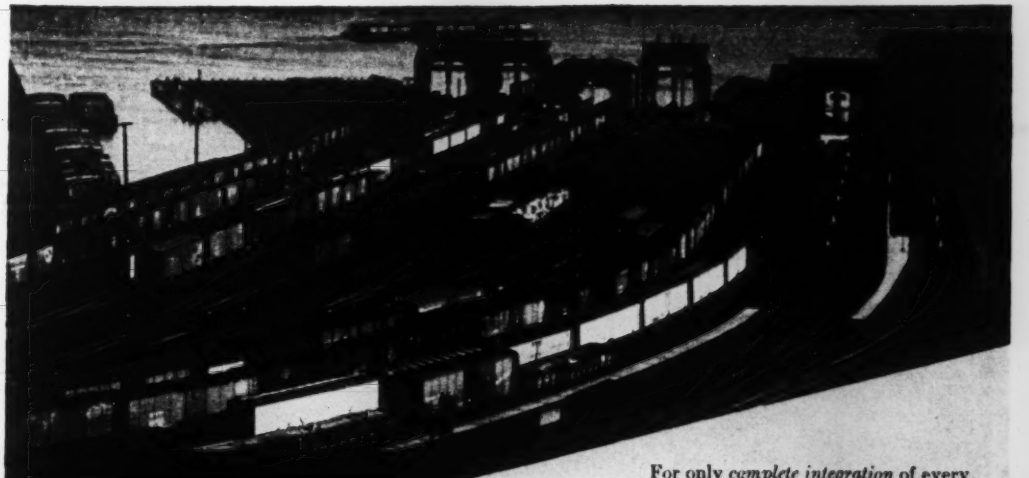
Welding Stainless Steel Angles Licks Deadline

FABRICATING steel angle pieces by arc welding solved a contract deadline problem at Puget Sound Bridge & Dredging Co., Seattle. Stainless steel guide angles for the fixed wheel gate frames at Canyon Ferry Dam in Oregon were unavailable from either mill or warehouse so the company made their own.

Taking 18-8 stainless $\frac{3}{4}$ x 6-inch flat bar stock, they sheared it to proper length, tack welded the angles, and backed up one angle against the other for butt welding on the outside seam. The first attempt resulted in considerable distortion, so the rest of the tacked assemblies were opened 3 degrees before the corner weld was made.

Angle Closed To 90°—A Lincoln Electric manual welding head, ML-1, of the submerged arc type was used, with 5/64-inch wire and No. 780 flux. The head, riding on a track alongside the angle, was guided by an operator. After this weld was completed, the angle was found to have opened 5 degrees, but when it was turned over and the inside fillet weld laid down, the angle closed to the desired 90 degrees. Butt weld was deposited at 28 inches per minute, the fillet at 18 inches per minute.

After a final straightening operation in a press, the piece was ready for installation in the gate frame. The contract deadline was met.



THE STEEL YOU BUY DEMANDS *Complete Integration* TOO!

For only *complete integration* of every process can assure you quality-as-specified. Here is the big reason for Alan Wood Steel Company's *single control* of each production step—from ore mine to finished product.

Alan Wood steel making takes nothing for granted—involves no outside factors. We mine our own ore, test it in our own laboratories, smelt it in our own furnaces, roll it in our own rolling mills. And rigid Alan Wood quality control checks on every process—every step of the way.

Here is your warranty of *quality steel as specified!*

SPECIALTY PRODUCTS

STAINLESS CLAD STEEL

PERMACLAD Stainless Clad Steel combines the surface characteristics of solid stainless with the easy forming qualities of mild carbon steel—provides corrosion resistance at lower cost.

ABRASIVE ROLLED STEEL FLOOR PLATE

A.W. ALGRIP Abrasive Rolled Steel Floor Plate is made by rolling tough abrasive grain as an integral part of the upper portion of steel plate. Result: Positive protection against slipping, even on steep inclines.

ROLLED STEEL FLOOR PLATE A.W. SUPER-DIAMOND

Rolled Steel Floor Plate, made with an allover, engineered pattern of raised, skid-resistant diamonds, is easy to clean, easy to match, and grips without a slip.

PRODUCTS OF ALAN WOOD STEEL COMPANY

IRON PRODUCTS
"Swede" Pig Iron
Foundry, Malleable, Bessemer and Basic

STEEL PRODUCTS
Plates (Sheared)
Tank, Ship, Boiler, Flange and Structural Qualities
Furnished in carbon, copper, or alloy analyses
A. W. Dynalloy
(High Strength Plates)

HOT ROLLED SHEETS
Special qualities in carbon, copper, or alloy analyses
A. W. Dynalloy
(High Strength Sheets)

HOT ROLLED STRIP
Coiled and cut lengths
Carbon, copper, or alloy analyses

A. W. ROLLED STEEL FLOOR PLATES
A. W. ALGRIP Abrasive
A. W. SUPER-DIAMOND Pattern

STAINLESS CLAD STEEL
PERMACLAD Sheets and Plates
Standard and special qualities available in desired finishes

A.W. CUT NAILS
Reading Brand
Black, Quenched and Tempered

MINE PRODUCTS
Iron Ore Concentrates, Sintered Concentrates, Crushed Stone, Grit, Sand and Engine Sand

COKE
Foundry, Industrial and Domestic

COAL CHEMICALS
Coke Oven Gas • Crude Coal Tar Ammonium Sulphate • Industrial Benzol, Toluol, Xylol • Motor Benzol • Crude Solvent Naphtha Crude Naphthalene • Crude Tar Bases • Sodium Phenolate • Crude Light Oil Still Residue

ALAN WOOD STEEL CO. ESTABLISHED A.W. 1834 CONSHOHOCKEN, PA.

Over 125 Years of Iron and Steel Making Experience

ONE CONTROL FROM MINE TO USER

ALAN WOOD STEEL COMPANY

CONSHOHOCKEN, PA.

IVY ROCK, PA. • SWEDELAND, PA. • DOVER, N.J. • OXFORD, N.J.

He's right!... Miss Pennington

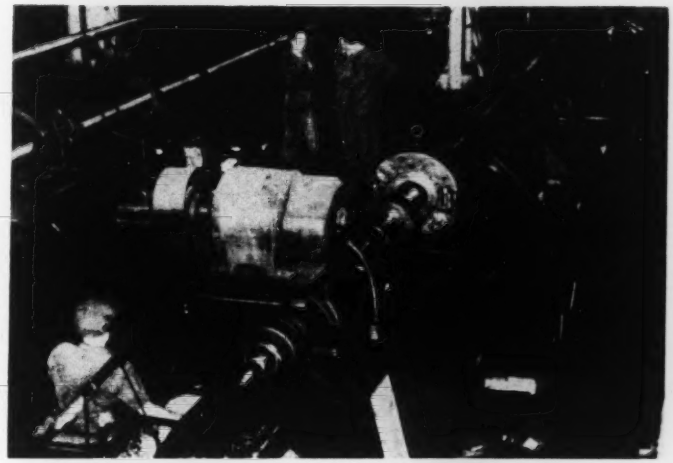
. . . **right** . . . according to the deficit spending carried out in our present day economy. Only a *"wheel deal"* politician can take **two dollars** from **your** pocket and **two dollars** from **my** pocket and get **five dollars to spend.**

If you agree that the little student in yesterday's schoolhouse was wrong . . . where are the Miss Penningtons of today who can put us back on the right track? It was **red-brick-schoolhouse arithmetic** that made our country strong and great . . . it was the Miss Penningtons who cast their ballots for the proper **adding of facts** . . . and it's going to take sound thinking Americans in the voting booths to make **two** and **two equal four once again.**

Cold Wrought Metal Fasteners by

Chandler Products Corp.

1491 CHARDON ROAD • CLEVELAND 17, OHIO



KENNAMETAL'S K4H WITH LATHE SETUP
. . . machines at 450-rpm with 0.008-inch feed

Thirty-Foot Holes Drilled in 2 Hours

Triple-edge off-center carbide drill head is used to machine a 3-inch hole through Brinell 260—320 oil well drill collars. Time saved: About 10 to 12 hours

CEMENTED tungsten carbide drill heads effect a 10 to 12-hour time reduction on one drill collar machining job.

The triple-edge, off-center carbide units, made by Kennametal Inc., Latrobe, Pa., are used to drill 3-inch diameter holes through 30-foot long chrome-nickel-molybdenum oil well drill collars. According to Kennametal, they do the job in less than 2 hours actual machining time.

Until recently, high-speed steel spade drills were used on this operation. Reports indicate machining time reached from 12 to more than 14 hours, with three or four tool changes required to drill one collar completely.

In practice, the hole is drilled halfway through the collar at 450 rpm with 0.008-inch feed. Boring bar revolves at 10 rpm in the opposite direction from the workpiece. After a freshly-ground head is mounted, the workpiece is reversed and drilled from the other end.

Conversion to High Speed—The machine used for this operation is a Niles boring lathe converted to high-speed work by installation of roller bearings in the spindle. The lathe is driven directly by a 50-hp direct current motor. Rheostat speed control permits infinite adjustment to avoid chatter.

From his position on the side of the carriage as it feeds the bar, the operator can tell quickly the condition of drill cutting edges by color and shape of chips produced. He can check power constantly on a wattmeter mounted directly in front of him. Soluble oil coolant is pumped around the hollow drill bar's outside diameter at 90 psi, washing chips back through the boring bar.

Easy Chip Disposal — Three stepped tips comprising the cutting edge of the 3-inch drill head divide chips into three sections. A chipbreaker on each tip curls and breaks up the sections for easy disposal.

Drill point is 0.170-inch off center. Thus, it makes a circular forming cut that prevents build-up and produces ragged pointed chips. Kennametal wear pads on the drillhead side guide the drill from the time it enters the starting hole. These pads and the self-centering action of the cutting edges help assure a straight bore. Clearance between wear pad diameter and cutting diameter is about 0.010-inch.

Drill head bodies are cast steel and require little machining before brazing in the cemented tungsten tips. Two 30-foot collars can be drilled before the bore is undersize.

Inserts Pare Service Wear

STAINLESS steel wire thread inserts are working two advantages for Fageol Products Co., Kent, O.

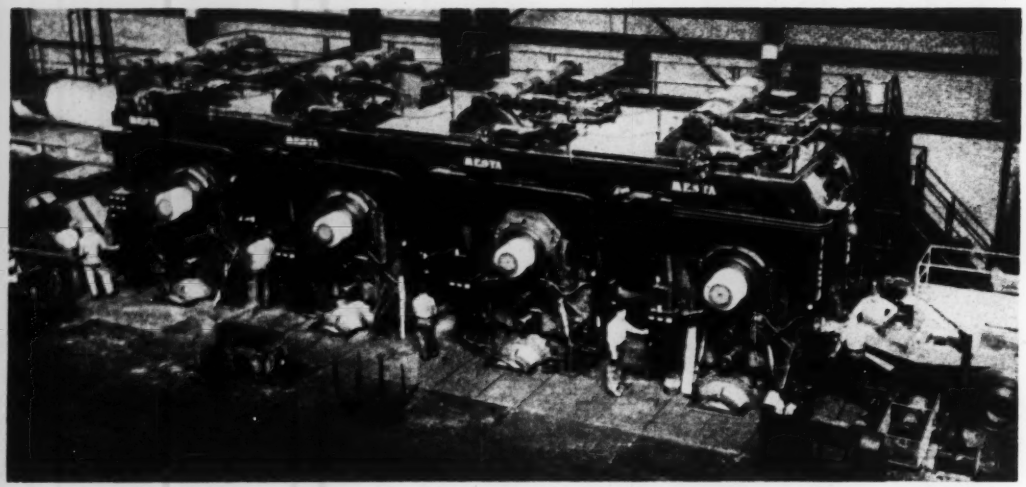
According to the company, use of the inserts as liners for tapped holes in aluminum castings ups automotive and industrial engine production about 6 per cent. In addition, they report inserts in relatively inaccessible tapped holes sharply reduce service difficulties in the field.

Premature Wear—In Fageol's 150 to 225-hp engines, inserts were used formerly only where periodic removal of inspection plates led to accelerated thread wear. More recently, aluminum parts were specified on 40 six-cylinder engine models. Low-loading characteristics of threads tapped directly in this relatively vulnerable metal posed problems in both manufacture and maintenance.

Even normal assembly was often fatal to threads. Surviving this, they became prematurely worn by removal of parts for adjustment.

Assembly Damage Out — Supplied by Heli-Coil Corp., Danbury, Conn., the inserts eliminate assembly thread damage, thus cutting production salvage costs. In addition, threads are properly shielded from wear in service.

Use of inserts also headed off what promised to become a serious service problem, impending when unprotected aluminum threads were located in places of difficult access. Such spots on these engines included the timing chain cover and distributor gear box. In both assemblies, inaccessibility when installed would have made a plug-and-retap repair operation needlessly difficult.



Top operating speeds of tandem cold-reduction mills have increased, but not threading speeds. These wider speed ranges complicate drive problems

Electric Brains Expand Steel's Muscle

Automatic regulating systems for main and auxiliary mill drives get more tonnage from existing equipment through higher operating speeds

By W. R. HARRIS
Manager Metal Working Section
Industrial Engineering Dept.
Westinghouse Electric Corp.
East Pittsburgh, Pa.

AUTOMATIC regulating systems are a well-established and integral part of electric drives for the steel industry. The most pertinent reasons for this are the widespread and increasing use of continuous mills and processing lines, and the trend toward higher speeds, both of which make regulating equipment mandatory. An operator, no matter how expert, is not physically or mentally capable of performing the complex functions required to tie continuous processes together, or to properly control a high-speed drive during acceleration or deceleration.

The tandem cold-reduction mill is a classic example of increase in operating speeds. The first tandem mill was installed in 1928. Its top rolling speed was 340 fpm and the total horsepower of the five motors driving the stands and the reel was 1020. By 1936 the speed of most mills was about 1500 fpm, more than a fourfold increase. Since that time the speed has risen at a phenomenal rate; one mill scheduled for operation soon has a maximum speed of 7000 fpm. The average speed of the ten 5-stand tandem cold-reduction tin plate mills installed since 1946 is 4696 fpm.

Rapid Response—Many technical advances in drive equipment have been necessary to obtain operation at these speeds. Outstanding among these is the individual generator system, which requires an exceptionally quick response and stable regulating system.

Man-hours per ton of finished steel, shown in the chart, are a remarkable reflection of the effect of

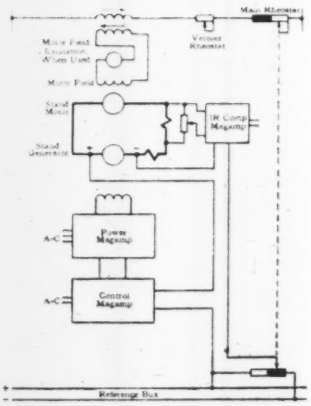
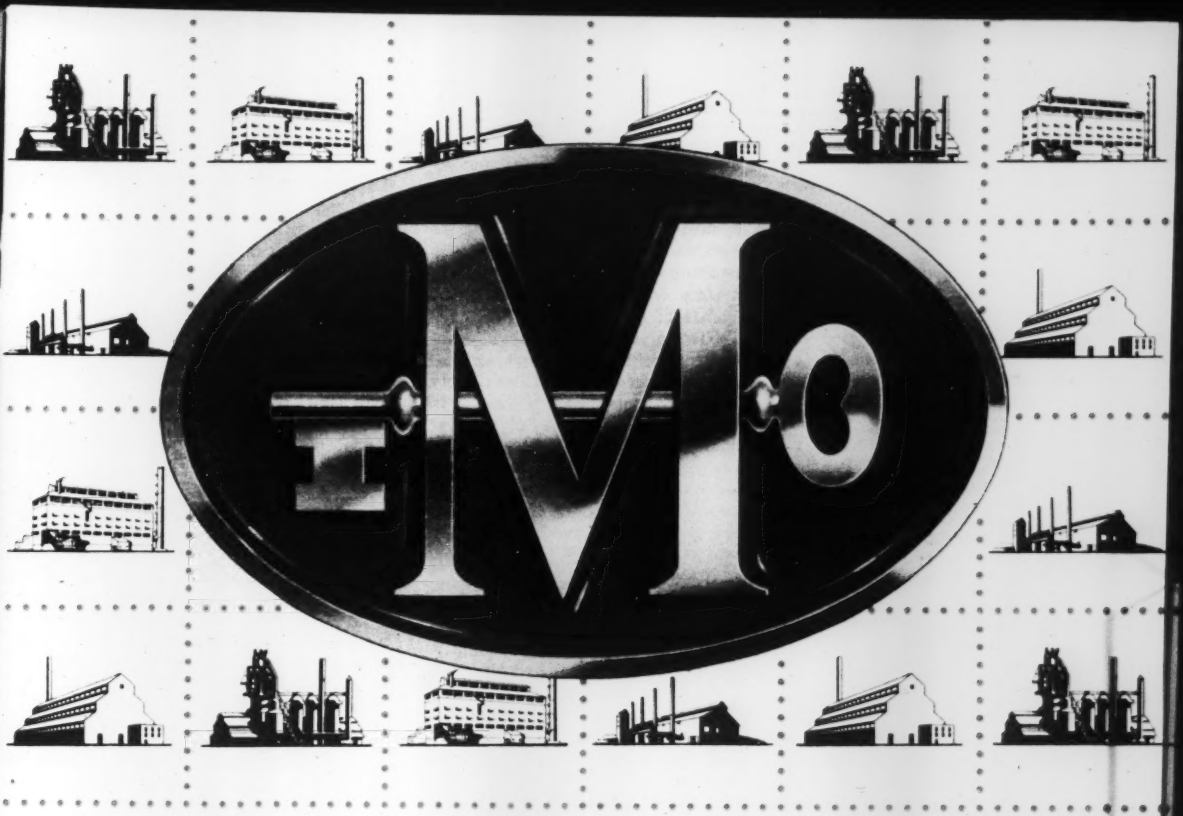


Diagram of Magamp system regulator for one stand of tandem mill drive



The Mark of Sound Engineering . . .

FOR

BLAST FURNACES

SINTERING PLANTS

OPEN HEARTH SHOPS

ROLLING MILLS

THIS is the mark of McKee engineering. To steel men all over the world it means sound plant design and thorough, efficient engineering and construction. McKee experience covers almost half a century of design and construction of all types of iron and steel plants and auxiliary equipment including sintering plants and other ore preparation facilities. McKee services are backed by an organization with the scope and resources to undertake your project and fulfill the promise that *McKee Engineering means assured results.*

DESIGN, ENGINEERING AND CONSTRUCTION FOR THE IRON AND STEEL AND PETROLEUM REFINING INDUSTRIES

McKee Engineering

Arthur G. McKee & Company • Established 1905

Headquarters: McKee Building, 2300 Chester Avenue, Cleveland 1, Ohio. *New York Office:* 30 Rockefeller Plaza, New York 20, N.Y. • *Washington Office:* 1507 M Street, N. W. Washington, D. C. • *England:* The Iron and Steel Division of Arthur G. McKee & Company is represented by Head, Wrightson & Company, Ltd. *District Engineering Offices:* Union, New Jersey and Tulsa, Oklahoma.

continuous mills and higher processing speeds. The curve shows a rapid decrease in required man-hours for 1939 and 1940, which followed major developments in high-speed continuous rolling of hot and cold strip. The high tonnage capacity of such installations caused the shutdown of many old hand mills. The electrical-manufacturing industry shared in this development to an unusual degree; such mills would have been impossible without the development of successful drive systems. During the war years the man-hours per ton remained relatively constant as the industry concentrated on maximum production from existing facilities. Since then, increases in speed and in use of continuous mills has considerably lowered the man-hours per ton.

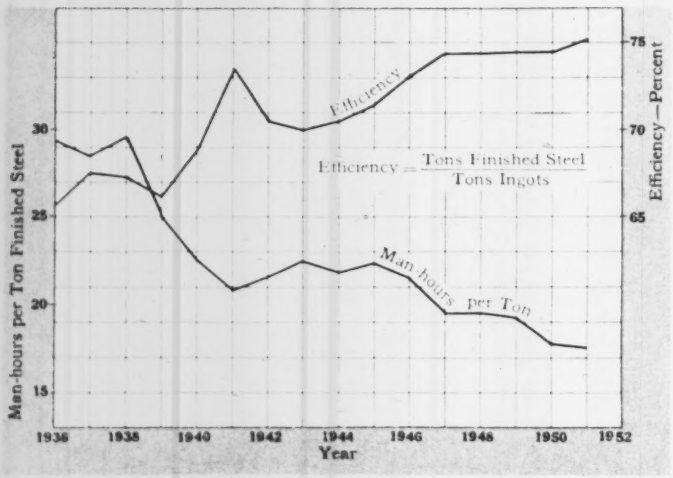
Requirements Are 4-Fold—In selecting a regulating system for a steel-mill drive the primary considerations are: 1. Steady-state accuracy required, 2. the transient response required, 3. the degree of stability necessary, and 4. a high degree of availability coupled with low maintenance.

Steady-state accuracy requirements for most steel-industry drives are moderate. Only a few, such as tandem cold-reduction mills and rod mills (where impact drop must be minimized) require precise steady-state accuracy.

The steel industry requires an unusual degree of transient response and stability on drive regulating systems. Good transient response is necessary for a quick return to normal; good stability is necessary so that the regulating system does not add further disturbance.

Electrolytic tinning lines, continuous pickling lines, and continuous galvanizing lines utilize a truly continuous process; however, in these mills one section of the line must be stopped while the process section continues, sometimes at reduced speed in order to weld or stitch on a new coil, or to eject the finished coil from the system and start the strip on a new reel.

No Waiting Around—Reversing mills, i.e., blooming, slabbing, or plate mills, also require fast transient response and good stability. Both the main drive and the auxiliary drives (such as tables, screwdowns, and manipulator fingers) must reverse rapidly to pass the steel back and forth through the rolls. After the metal passes through the main rolls, the auxiliary drives must position the screwdown quickly, reverse the tables to bring the metal back to the mill, and perform the manipulating operations required in preparation for the next pass.



Effect of greater use of continuous mills and higher processing speeds reflects itself in higher efficiencies and much lower man-hours per ton

Regulating systems for such drives must have quick transient response either to accomplish the operation in the desired time or to maintain a close tie between different parts of a system during changes in speed. Often exceptional stability is required to maintain the proper tension between units to prevent breaking the strip or "throwing" loops.

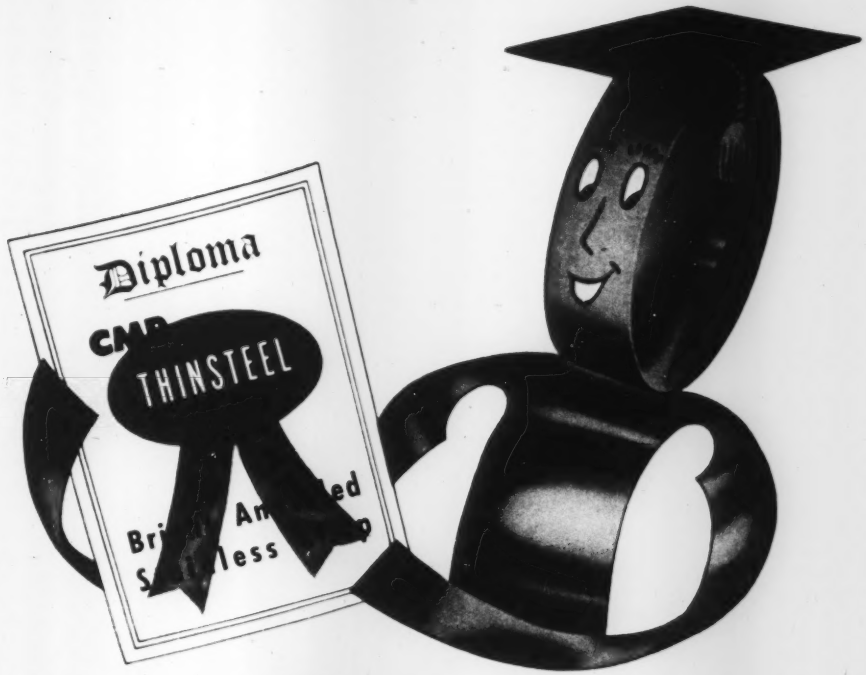
The foregoing comments have stressed regulating systems rather than the regulators themselves. The regulator is merely one component of a total system. To obtain the most from these systems good regulator design must be coupled with good basic motor and generator characteristics, and good control all tailored to fit the application. The regulating element, no matter how excellent, cannot fully compensate for improper characteristics elsewhere in the system. For example, excess saturation in a generator can lower system amplification and impair system performance just as effectively as a poorly applied regulator.

Typical illustrations of regulator applications in the steel and allied metalworking industries, are the individual-generator tandem cold-reduction mill drive, the main and auxiliary drives of a slabbing mill, and the drive for a high-speed side-trimming line.

Tandem Mill Drives—Steel strip used for cans, refrigerators, stoves, automobiles, and toys is the product of cold-reduction mills.

The metal must be threaded through the stands at relatively slow speed. The mill is then accelerated to operating speed and runs at this speed until the coil is nearly finished, when it is decelerated to slow speed to let the end of the coil go through the mill. Although the top operating speed of such mills has increased tremendously, the threading speed has not increased appreciably, and the resultant wider speed ranges have multiplied drive problems.

Thickness decreases as the metal travels through the mill. The speed of each successive stand increases accordingly. It is necessary to accelerate the complete mill and to maintain proper speed and tension relationships between the individually driven stands and the



Now, a BA in Stainless

Brilliance is often honored with special degrees and other ribbon tied, hand lettered salutations. But this B.A. stands for Bright Annealed and to many stainless fabricators it is as important as money in the bank. You see, CMP Bright Annealed Stainless Cold Rolled Strip beat a costly problem by providing a mirror-like finish on chrome-nickel grades, even in dead soft temper. And that is a big money saver because it can practically eliminate or substantially reduce expensive polishing and finishing.

To find out how Thinsteel Bright Annealed Stainless Strip can improve your production or lower end-product costs write or phone us today. We'll be glad to arrange a sample order for your own comparative test. With labor costs up, a potential saving in your finishing costs is more important than ever before, and worthy of your investigation NOW.

the Cold Metal Products co.

YOUNGSTOWN 1, OHIO

New York • Chicago • Indianapolis • Detroit • St. Louis • Los Angeles • Cleveland

LOW CARBON, HIGH CARBON (Annealed or Tempered) ***STAINLESS AND ALLOY GRADES, ELECTRO ZINC COATED ARE AVAILABLE FROM:***

THE COLD METAL PRODUCTS CO. of CALIFORNIA, 6600 McKinley Avenue, Los Angeles
Phone: PLeasant 3-1291

THE KENILWORTH STEEL CO., 750 Boulevard, Kenilworth, New Jersey
Phones: N. Y., COrtlandt 7-2427; N. J., UNionville 2-6900

PRECISION STEEL WAREHOUSE, INC., 4423 W. Kinzie, Chicago • Phone: COlumbus 1-2700

reel. The tension horsepower between stands is a considerable portion of the total motor load, and the accelerating torques can equal or exceed the rolling torques. For example, the fourth stand of a mill driven by a 3000-hp dc motor has the following loads:

Rolling horsepower	2250
Back tension horsepower	1100
Forward tension horsepower	350
Net horsepower running	3000
Accelerating horsepower	2100
Net horsepower accelerating	5100

The drive problem is further complicated because, for reasons not well understood, during deceleration periods the thickness of the metal increases as much as 15 to 40 per cent. The drive must be designed to fit this mill characteristic so that the gage is maintained as closely as possible without exceeding safe tensions between stands.

Requirements Are High — With individual-generator drive the voltage of each stand generator is matched to a reference bus voltage through a precise control system that is in full control from standstill to maximum speed — an infinite range. Such a system has the following rigid requirements in the industry:

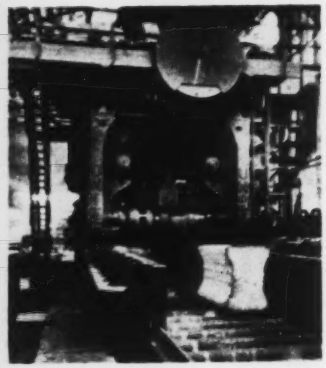
1. High steady-state accuracy to assure close tracking of all stands from threading to running speeds and to prevent creeping of the motors at standstill.

2. Fast and well-damped transient response to assure proper maintenance of tension between stands during acceleration, deceleration, and emergency stops, and to prevent "rocking" when stopping.

3. Adjustments must be simple and independent of one another so the system can be quickly installed and tuned and so that maintenance is simplified.

4. Most important, the system must have a high degree of flexibility so that it can easily be set up to roll a wide range of schedules.

A schematic diagram of the drive and control system for one stand of a tandem cold mill is shown in the accompanying chart. Each stand has a similar drive arrangement. All generator voltages



Blooming or slabbing mills require close co-ordinated reversing drives

are matched to the reference bus through a Magamp control system. The generator voltage is compared with the reference voltage and the difference applied to the control Magamp, which in turn controls the power Magamp and the generator field. To compensate for the resistance drop in the armature circuits of the stand motor an IR-compensation Magamp is used. This modifies the voltage relationship between the generator and the reference bus and increases the generator voltage in proportion to the current in the main circuit. Such compensation is used on all modern drives to improve acceleration characteristics so that the motor speed more nearly follows the generator voltage; to ensure that the metal reaches proper gage quickly during acceleration; and that gage is better maintained at full speed.

Why Unit Was Built—This Magamp control system was developed to equal or better the excellent performance obtained from the rotating-regulator systems now in use. It was built and tested on full-scale tandem-mill equipment at the Westinghouse East Pittsburgh Works; a complete system is now being built for a large 4-stand mill. The system will use 400-cycle magnetic amplifiers, which have high gain and, compared to that of the generator field, insignificant time delay. High gain assures good steady-state accuracy and fast transient response. Low time delay eliminates overshooting or hunting because the inherently stable single time-delay system is closely approximated.

Response curves and output Magamp voltage curves were taken by inserting an instantaneous voltage into the reference bus by suddenly switching a battery into the circuit. This test is more stringent than any possible mill operating condition but serves as an excellent measure of control-system performance. The response, as indicated by the error voltage trace, was less than 0.1-second and was essentially the same at both weak field and full field on the motor. The exciter voltage trace shows that the power Magamp voltage rises to 4½ times normal in less than 1/30-second whereas the generator shunt field time constant is approximately 4 seconds. These tremendous forcing voltages are responsible for the fast system response. This performance is amazing when it is considered that in less than 0.1-second the generator field voltage rises to many times its rated value to force the correction and then returns to normal to prevent overshooting.

Blooming or Slabbing Mill—A view of this type mill with a white hot ingot on the table is shown in the accompanying photo. Such ingots weighing several tons and measuring approximately 24 x 24 inches in cross section, are reduced by repeatedly passing them between the main rolls, which must be reversed for each pass. The finished product may be a slab 4 inches thick by 48 inches wide or a bloom with a 15 x 15 inch cross section.

To position the rolls for each succeeding pass the top roll is moved up and down by the screwdown drive. The tables must also be driven by reversing drives, as must the feed rolls, which are table rolls adjacent to the mill. The heavy manipulators shown in the foreground are used as guides to position the ingot for passes through various parts of the main roll body. The fingers, which operate from the slots that can be seen in one manipulator, are used to turn the ingot when necessary. Modern practice is to drive such auxiliaries with rotating-regulator-controlled variable-voltage systems.

Main Drive—The twin motors of

TENNESSEE CONTROL CENTER

Fabricating Steel is Our Business

The State Office Building at Nashville, Tennessee is the most recent monumental building for which Ingalls has fabricated the steel. Creighton-MacDonald, Contractors, Hart and McBryde, Architects.

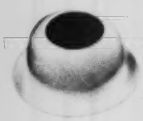
THE INGALLS IRON WORKS COMPANY

BIRMINGHAM, ALABAMA

Sales Offices: New York, Chicago, Pittsburgh

Plants: Birmingham, Ala., Verona, Pa., North Birmingham, Ala., Pascagoula, Miss., Decatur, Ala.

PREFORM



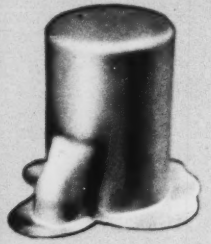
PIERCE, TRIM AND BLANK

EDGE

Here's what you can do by

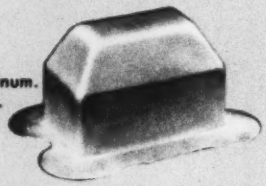
Hydroforming

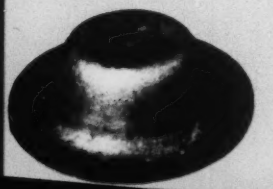
Cover of 0.064" 2SO Aluminum. Hydroformed in 2 operations.



Strainer of 20 gage perforated cold rolled steel. Hydroformed in 1 operation.

Cover of 0.040" 3SO Aluminum. Hydroformed in 1 operation.

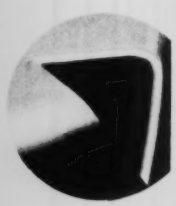




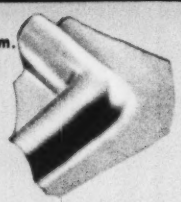
Cap of ⅜" cold rolled steel. Hydroformed in 1 operation.

HOLD CLOSE TOLERANCES

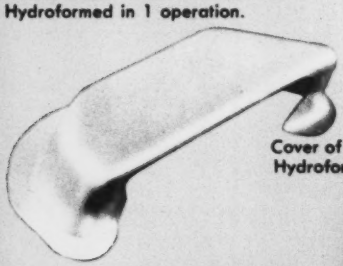
SANDWICH



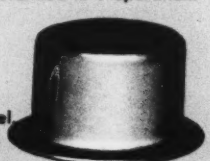
Angle assembly of 0.075" Aluminum. Hydroformed in 1 operation.



Aircraft detail of 0.040" Aluminum. Hydroformed in 1 operation.



Cover of 0.032" Aluminum. Hydroformed in 1 operation.



Vessel of ¼" cold rolled steel. Hydroformed in 1 operation.

PRODUCE DEEP DRAWN PARTS WITH VERY FEW LIMITATIONS AS TO SHAPE

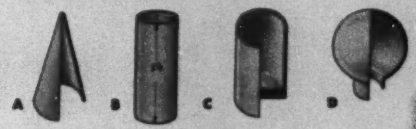
Hydroforming has revolutionized deep drawing. The parts and forming operations illustrated on the opposite page show the extreme versatility of this process. Note the wide variations in part shape. Note, too, that Hydroforming is *not* confined simply to the production of round or symmetrical parts.

WORK WITH A WIDE RANGE OF MATERIALS

Parts can be Hydroformed of steel, aluminum, magnesium, copper, aluminized steel, brass, plastics, insulating materials and precious metals. High-strength alloys successfully Hydroformed include titanium, Inconel, Nimonic 75, L-605, stainless steels, stainless-clad copper.

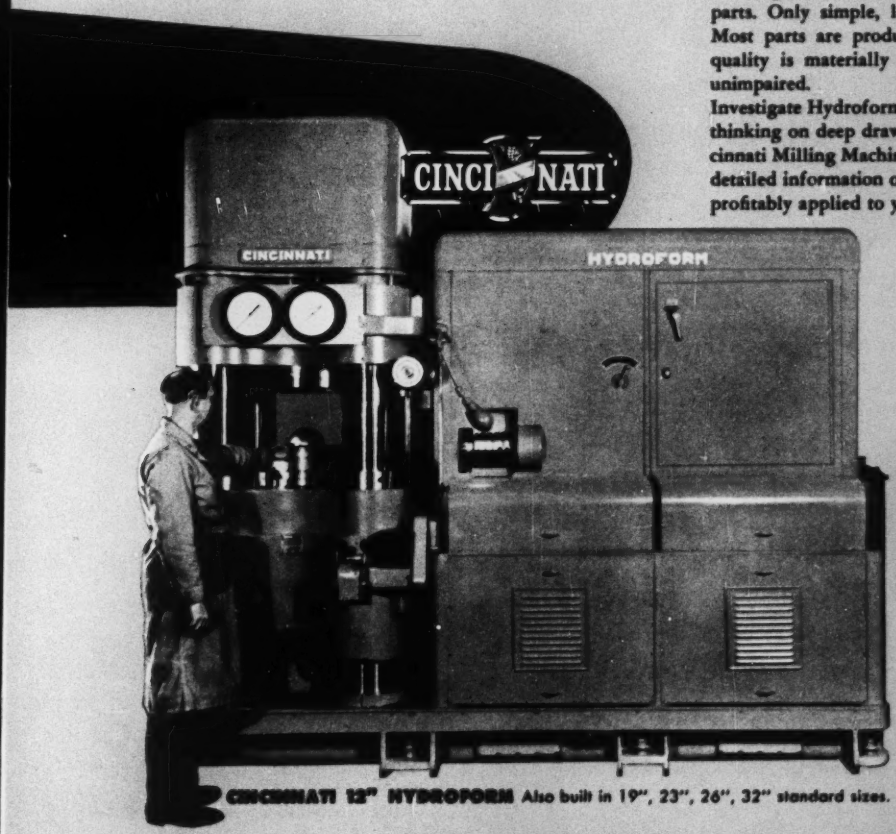
Blank thickness can range from foils to 3/8" mild steel. Blanks ranging up to 32" maximum diameter can be drawn in standard machines. Larger equipment available on application.

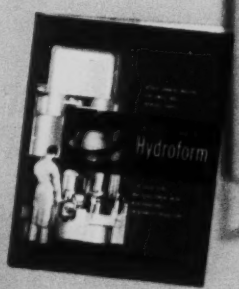
There are several basic shapes that cannot be practically Hydroformed. It is not practical to form sharp, pointed conical shapes (Fig. A). Straight-walled cup shapes having a depth to diameter ratio of 2½ or more to 1 are not practical to form (Fig. B). Parts similar to shell casings which have a relatively thin wall as compared to a thicker closed end cannot be Hydroformed (Fig. C). Bulged parts having a small opening are impractical to form. Parts of this type with a large opening can be made using a segmented punch for removal after forming (Fig. D).



With the few exceptions noted above, practically *any shape* can be Hydroformed. In addition, Hydroforming brings to industry many other benefits affecting the time and cost of producing deep drawn parts. Only simple, low-cost tooling is required. Most parts are produced in a single draw. Part quality is materially improved. Surface finish is unimpaired.

Investigate Hydroforming now. It will change your thinking on deep drawing and forming. Let a Cincinnati Milling Machine Co. field engineer give you detailed information on how Hydroforming can be profitably applied to your production.





Write for your copy of Hydroform Bulletin M-1759

Hydroform

CINCINNATI 12" HYDROFORM Also built in 19", 23", 26", 32" standard sizes.

THE CINCINNATI MILLING MACHINE CO.

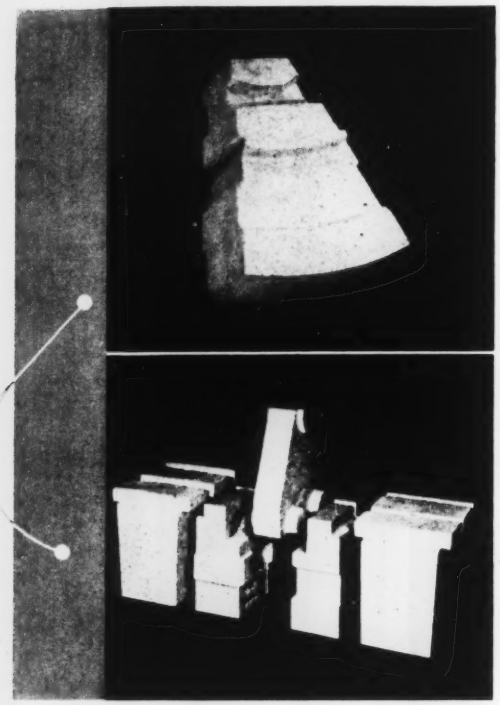
CINCINNATI 9, OHIO

1000 to 1300 Heats

at 1/4 the cost

with LACO "600" Special Refractory

PE 84 nose tile made of LACO "600" special refractory



Tile components, Laclede tile suspended arch

Records up to 1340 heats on Noses and Fan Tails have been reported by large Eastern steel mills using LACO "600" special refractory in Open Hearths and in hot zones of Slab Heating Furnaces.

Now proven in performance, LACO "600" was field tested for over ten years in advanced Open Hearth designs on new furnaces and rebuilds. *Of 28 furnaces equipped by Laclede Arch Company in the last two years*, ranging in size from 165 tons capacity to 275 tons capacity, most are utilizing LACO "600" on fan tails, noses, chill walls, or burner arches. LACO "600" cuts heat losses, keeps maintenance expenses down, costs less to install and has long service life, improves furnace operation, reduces air infiltration, saves *time* and money. **It costs one-quarter as much as expensive chrome and magnesite brick sometimes used in Fan Tail and Nose construction.**

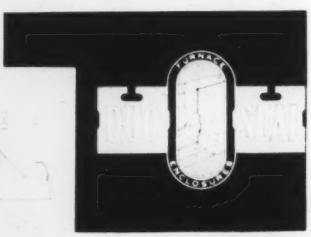
Yes, these locations have tough operating conditions, but LACO "600" special refractory meets these conditions with service and economy. Why does a clay brick costing so little perform so well?

The answer, backed up by ten years of field tests, lies in the unique combination of refractory properties, high resistance to spalling, excellent volume stability, high melting point, uniformity, **plus the method of suspension.** All of this adds up to *increased furnace availability at the right price.*

Let's go **downstairs** to cut costs and step up production and furnace availability with *Suspended* LACO "600".

Every type of refractory or suspension has its proper economical place.

Let us show you some designs and performance records.



Laclede Arch Company

Division of Laclede Christy Company

1705 Mallers Building, 5 S. Wabash Avenue · Chicago 3, Ill.

Telephone: Andover 3 6755

Branch Offices: Pittsburgh · New York · St. Louis · Los Angeles

the main drive of a typical blooming mill are each rated 3500 hp, 35/80 rpm. Such motors are designed for an occasional peak torque of 2.75 times rated value, and frequently repeated torques of 2.25 times rated value. A flywheel motor-generator set supplies power to the main drive motors and a liquid slip regulator controls the input to the wound-rotor motor driving the set.

The main circuits for the reversing mill main drive have as many as four generators and as many as four main motor armatures. For example, two 12,000-hp drives are now under construction with double-armature, twin-drive arrangement for the main rolls utilizing four 3000-hp motors. These motors are supplied with power from four 2500-kw dc generators. The mills also have edging rolls, driven by a 4000-hp double-armature motor supplied with power from two 1750-kw generators.

Rototrol rotating regulators are used to regulate the motor field current, the generator voltage, and to assure proper division of load where generator or motor armatures are operated in parallel. The exciters and Rototrol regulators are provided with ceiling voltages of several times normal in order to force the sluggish fields of the main machines to respond quickly. Current-limit Rototrol regulators are arranged so that if the main armature current exceeds a certain value further changes in motor field or generator voltage will be halted.

Regulator systems for this application should have moderate steady-state accuracy, and good transient response and stability. The response of the fastest reversing mill in the world—a 10,000-hp, 40/80-rpm twin-drive recently installed—is from forward to reverse in one second. A maximum exciter voltage of approximately 10 times normal is necessary to force this fast response. Most mills have base-to-base speed reversal times of from 1½ to 2½ seconds.

(To Be Continued)

Rutile Substitutes Needed

Developing domestic substitutes for rutile, a highly essential mineral to defense production, is of vital importance. About three-fourths of the U. S. supply presently comes from Australia, according to William A. White, divisional director of NPA.

Known substitutes for rutile include tanarc, made from steel mill slag, and brookite, a mineral found in Arkansas and possibly elsewhere in this country. Some industry people believe, says Mr. White, that brookite can be substituted directly for rutile in many cases, while tanarc is used with rutile to reduce the amount of that mineral required in welding rod coatings.

Some progress in the development of these substitutes has been made, Mr. White explained, but not enough to free industry from the threat of shortages if import supply were cut off. Sole domestic source of rutile is found in old Florida beach sands, but there are other known deposits not now in operation.

P & H GANTRY WITH BUILT-IN POWER SOURCE
. . . design permits free yard movement for towering booms

Diesel-Powered Gantry Meets Special Power Need

GANTRY CRANE operating at a large plant in northern Michigan has its own power source to meet a varied set of demands in power application.

In this operation, a traveling crane for the usual yard service, with its overhead power lines, was ruled out on two counts. First, the manufacturer makes equipment with towering booms that require free movement around one section of the yard. This prohibited an overhead power source for safety reasons.

Secondly, temperatures in the plant location pose icing problems. However, high initial cost and difficult maintenance made underground power lines prohibitive.

Diesel Power — Harnischfeger Corp's solution is seen above. The company built a 60-foot-span gantry crane with 15-ton capacity. A 3-ton auxiliary has as its own power source a built-in diesel engine-powered generator. This is mounted on the crane sill and is fully enclosed.

A P & H 4-cylinder 80-hp diesel engine drives a 50-kw direct-current generator for all crane operations. The operator has all engine controls in his enclosed, heated cab and can start, stop and regulate the engine from this position.

Interlocked Motors—For positive operating uniformity, the gantry crane has individual electric motors on each sill. These are electrically interlocked to prevent one shear leg from getting ahead of the other.

The crane was built at Harnischfeger's Milwaukee plant, then shipped to the site for assembly.

modernize your conveyors, too!

Logan Apron Conveyor forms an efficient assembly line for coal and wood heaters. Parts manufacturing operations are completed at far end and heaters are then assembled along the conveyor run.

New machine tools and new processes are the order of the day.

But don't overlook the modernizing of your handling equipment. How long have your present conveyors been in operation? Have your "handling methods" kept pace with other plant improvements in the past decade?

Logan Conveyor engineering stays constantly abreast of the moving times. Avail yourself of this skill and experience when in the market for new handling equipment . . . obtain the extra value found in Logan layout and conveyor design. Write for literature, or for engineer to call.

Logan Conveyors

LOGAN CO., 535 CABEL ST., LOUISVILLE, KY.

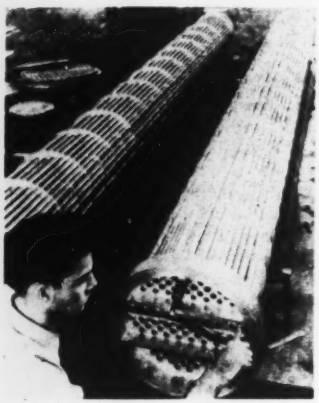
Welded Heat Exchangers

Alcoa says welded tubes offer lower cost, better protection than drawn seamless type

LOW PRICE TAG plus good protection against corrosion is the report by Aluminum Co. of America on its welded aluminum heat exchanger tubes.

Produced and marketed by Alcoa for the first time, the tubes are made by longitudinally butt welding Alclad 3S-H12 aluminum sheet instead of drawing seamless aluminum tubes. The same process can be used in making tubes for applications other than heat exchangers.

Lower Cost—Two sizes are available, 1-inch OD with 0.049-inch and 0.065 wall thickness. In these sizes, the company reports welded tubes cost 20 per cent less than seamless and substantially less per foot than tubes of other commonly used metals. In addition to lower cost, the welded type has protective Alclad coating on both inside and outside surfaces; seamless is coated only on the inside.



BUTT-WELDED TUBES
. . . several advantages cited

Weight tolerances, tube expansion, hydrostatic pressure tests and dimension tolerances — except for slight deviations in the weld area — are reported the same for the welded tubes as they are for the seamless.

Good Protection — According to Alcoa, typical tensile strength for Alclad 3S-H12 welded tubes is 17,-

YOU MAY save 3.15 POUNDS PER SHEET*

WITH

MicroRold®

STAINLESS STEEL

When you order sheet by gauge number the permissible A. I. S. I. variation in thickness is plus or minus 10%. Thusly, if you order 18 gauge, you may receive a sheet .052 thick when .0475 would suit your purpose. Using a standard 18 gauge 36"x120" sheet as an example, the theoretical weight is 63 pounds, but this weight could permissibly vary between 65.52 pounds and 59.22 pounds.

A sheet of MicroRold .0475 thick with a tolerance of only 3% would weigh 59.85 pounds thus insuring a saving of 3.15 pounds from the theoretical average-weight, or 5.67 pounds from the maximum, while still remaining within the 18 gauge ordering range.

Weight of One Sheet of 18 Gauge 36" x 120" Plus or Minus 10%

.052"—65.52 Pounds	
.051"—64.26 Pounds	
.050"—63.00 Pounds	Theoretical Wt.
.049"—61.74 Pounds	63.00 Pounds
.048"—60.48 Pounds	
.047"—59.22 Pounds	

Weight of the same size sheet of .0475 plus or minus 3% is 59.85 pounds with an average saving of 3.15 pounds per sheet.

Multiply this saving by the number of sheets you use per month and the price per pound and you have a good dollar and cents reason for buying MicroRold.

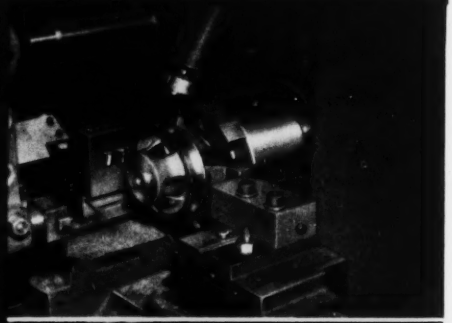
** Each additional 1/1000" of thickness adds 1.26 pounds weight per sheet.*

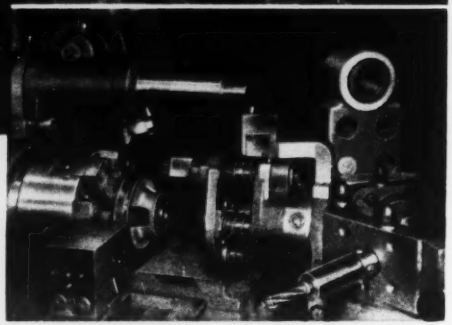
WASHINGTON STEEL CORPORATION
WASHINGTON, PENNSYLVANIA

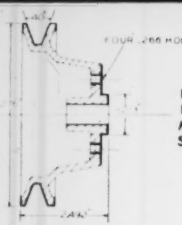
POTTER & JOHNSTON TOOLING

14 OPERATIONS with ONE SETTING

P&J 3U SPEED-FLEX







HEAVY LINES INDICATE MACHINED SURFACES.

Difficult chucking jobs — like finishing the cast iron pulley shown above — are done easily, rapidly and economically with expertly engineered Potter & Johnston Tooling on a P&J 3U Speed-Flex. Full power and high spindle speeds allow fast metal removal with carbide cutting tools. The pulley groove is finish machined by two single-point slide tools — thus eliminating any distortion that might result from a broad face cut. As the last step, the four .266" holes are accurately located and drilled by a special, 4-spindle drill head that is automatically positioned and locked at the completion of the preceding operation. With this ingenious, time-saving set-up, all operations are performed automatically; one operator can easily handle several machines, and your labor costs are divided.

If your manufacturing operation requires the rapid production of small, precision parts, it will pay you to learn more about Potter & Johnston Tooling and the P&J 3U Speed-Flex Automatic Turret Lathe. See how this combination can help you increase output, improve work quality and reduce unit costs.

Send in sample parts or prints for tooling recommendations and time estimates — and send today for your copy of fully illustrated P&J Bulletin 145

POTTER & JOHNSTON COMPANY

PAWTUCKET, RHODE ISLAND

SUBSIDIARY OF PRATT & WHITNEY — DIVISION NILES – BEMENT – POND CO.

000 psi; yield strength, 14,000 psi. In trail installations, though allowable internal working pressures generally average two-thirds those of seamless tubes, the welded product performed satisfactorily.

Corrosion tests by Aluminum Research Laboratories indicate the Alclad coating protects the weld area. Outside weld bead is removed during manufacture and the small bead is flattened.

Standard lengths of 1-inch OD welded tubes are 12, 14, 16 and 20 feet. Special lengths can be ordered between 16 and 20 feet. Next on the market, according to the company, will be a $\frac{3}{4}$-inch OD tube.

Phosnic Bronze Takes Temper

Phosnic bronze is a high-copper alloy containing nickel and phosphorous, making it particularly suited for manufacture of parts where the combination of high strength, high electrical or thermal conductivity, high resistance to fatigue and creep and good workability are required. The product is a development of Chase Brass & Copper Co. Inc., Waterbury, Conn.

After age hardening, phosnic bronze, unlike some age hardening alloys in the heat treated condition, is suitable for severe cold working of any type. Suggested manufacturing uses include springs, clips, high-strength electrical conductors, bolts, nails, screws and cotter pins.

Machine Spots Jacket Leaks

Checking for leaks in the water jacket areas in automotive engine cast iron cylinder heads is the function of a new automatic conveyorized pressure testing machine built by Modern Industrial Engineering Co., Detroit.

In operation, heads are delivered to a transfer station on the machine from the conveyor line. A cycle start button is energized causing a hydraulic cylinder to transfer the head to the test station. There it is automatically sealed in three planes, checked for leaks by measuring air pressure loss, stamped and delivered back on the conveyor.

A red light indicates unaccept-

Engineering, production and economic advantages obtainable with forgings are presented in this Reference Book on Forgings. Write for a copy.

gs offer unlimited possibilities for solving Problem Parts Problems without creating other problems for other people. Check all the aspects of a problem part with the unrivaled economic and mechanical advantages of closed die forgings, and the closed die forging process for producing parts, and you will discover the possibilities for solving a problem part with closed die forgings. Then, consult a Forging Engineer about the correct combination of mechanical properties which closed die forgings can provide for your product.

DROP FORGING ASSOCIATION
605 HANNA BLDG • CLEVELAND 15, OHIO

Please send 60-page booklet entitled "Metal Quality — How Hot Working Improves Properties of Metal", 1949 Edition.

Name_____

Position_____

Company_____

Address_____

Beginning with the Yearbook Issue January 5, 1953,

the editors of STEEL will present a

Program for Management

● Metalworking management faces a year of decision. Never before have the men who direct the nation's 50,000 metalworking plants had so many decisions to make . . . decisions any one of which could mean success or failure for their respective businesses.

These decisions are basic and need the mature judgment of men well-schooled in the lessons of the past ten years.

These decisions are fundamental since they involve issues that will be with us regardless of who next occupies the White House or, for that matter, the Kremlin.

STEEL's editors appreciate that metalworking management's greatest need in times like these is information . . . timely, authoritative, reliable information . . . information management can use as a basis for its decisions, and around which it can build a plan for action.

In an effort to be of practical assistance, STEEL's editors have turned the combined energies and skills of their 32-man staff to the task of developing a useful and workable PROGRAM FOR MANAGEMENT.

In the Yearbook Issue and throughout the year, STEEL will bring you a series of special reports on the 10-point program outlined here. It is a forward-looking program designed to help you establish your company's production and sales objectives for 1953 and beyond. Watch for STEEL's Metalworking Yearbook Issue January 5, 1953 and the 51 issues to follow.

1. PRODUCTIVITY

Productivity must be maintained at a high level per worker. Each employe's efficiency must be stepped up through improved equipment, reduction in handling, better incentive plans, closer quality control and better flow of materials.

6. GOVERNMENT RELATIONS

How will the new administration affect the metalworking industry? Will CMP remain with us? Will the government continue to play "mother" to industry? These and other problems must be studied and resolved in the next four years.

2. HANDLING AND DISTRIBUTION

This could well be the most important single factor influencing business success or failure. Not only must plant handling and distribution costs be lowered, but new markets must be developed to maintain high product demand.

3. DEPRECIATION AND OBSOLESCENCE

A constant check must be kept on the productive capacities of plant equipment with an eye to maintaining peak performance and staying competitive quality-wise and cost wise. Obsolete machines may be picking your profits.

4. PUBLIC AND COMMUNITY RELATIONS

Good relations with the general public and people in the local community can lessen the danger of strikes, improve productivity. Public acclaim for good deeds cannot take the place of the good deed itself.

5. LABOR AND INDUSTRY RELATIONS

How to get workers, how to train them, how to make them more productive, how to keep them on your payroll and how to deal with them, these are the challenges which call for an intelligent, effective labor relations program.

7. NEW MATERIALS

What is their availability, what are their properties, where can they be obtained and at what cost? In addition to exploring uses for new materials, management must look for new applications for its "bread and butter" metals.

8. RESEARCH

It is in the intelligent application of research that industry's new horizons lie. Research efforts must take two paths to be completely effective for the manufacturer today. (1) product research and (2) market research.

9. NEW PRODUCTION TECHNIQUES

Improved processing methods and more efficient equipment will help industry get out more products faster, better and at lower cost with relatively less material. This is vital, particularly in a period of material scarcity.

10. PURCHASING METHODS

The purchasing agent's function is becoming increasingly important. Much of the secret to producing a product at lower unit cost rests in his ability to buy wisely. Methods must be constantly studied and improved.

MULTICUT TUFCUT HOT WORK

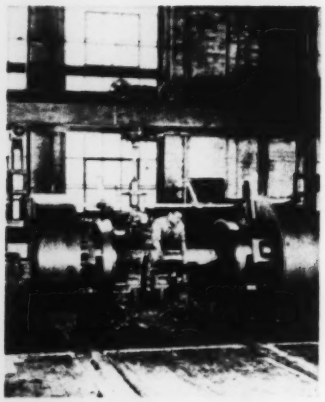
Wapakoneta
SHEAR BLADES
and ROTARY KNIVES

Any type or size blade of proper Alloy with correct hardness and temper for every type shearing machine and every kind of job.

Rx ENGINEERED TO THE JOB

Every Wapakoneta blade is made to exact specifications, designed for the particular job. Complete records with order number of each blade makes possible duplication of exact size and temper at any time.

The
WAPAKONETA MACHINE CO.
Shear Blade Specialists Since 1891
Wapakoneta, Ohio



Wheels Turned Faster

Car wheel lathe installed by Philadelphia Transportation Co. employs profiling equipment, hydraulic feeds and power-driven chuck to turn down a pair of 36-inch wheels with carbide tools in 28 minutes. The 70-ton, 52-inch Niles lathe is made by Baldwin-Lima-Hamilton Corp., Hamilton, O.

able parts and the machine automatically does not stamp these.

Orban Opens Service Center

Kurt Orban Co., distributor of European-built equipment, opened a new machine tool service and demonstration center recently in Newark, N. J. The third such center, this latest will serve needs of the company's eastern territory.

Engineers will be on hand to help solve customers' production problems and to train their personnel in the most effective use of the machines. Replacement parts are stocked and skilled servicing is available throughout the area.

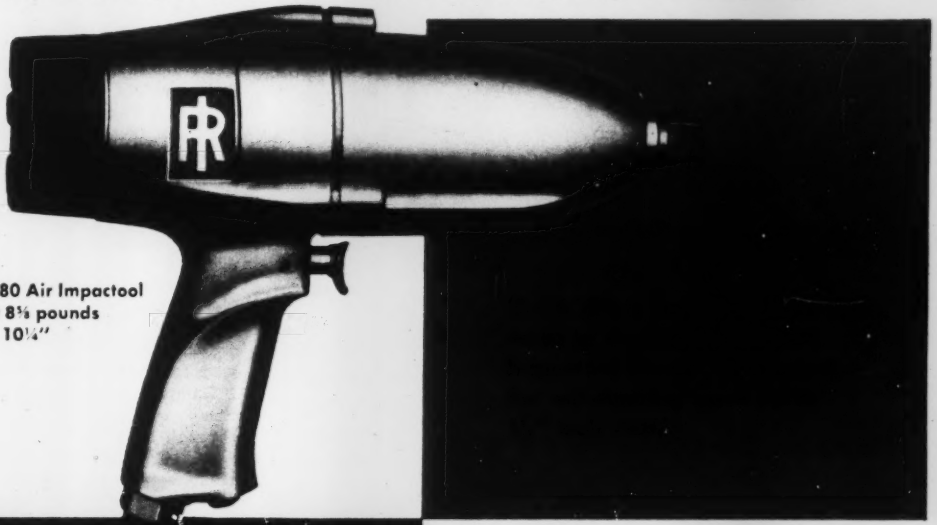
Hack Saw Standards Change

Revised standard schedule of sizes for hack saw blades, already approved by all American and Canadian manufacturers, will become effective Jan. 1, 1953, reports the Hack Saw Manufacturers Association of America Inc.

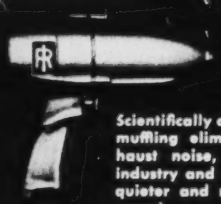
Changes in the schedule are nominal and result in a decrease of about 10 per cent in number of standard specifications. The revision supersedes Simplified Practice Recommendation R-90-49, now in effect.

SIZE 5080 IMPACTOOL CUTS RUNDOWN TIME 50%!

Use the Ingersoll-Rand Size 5080 Air Impactool for running nuts down fast...and drawing them up tight!



Size 5080 Air Impactool
Weight 8⅛ pounds
Length 10¼"



QUIET

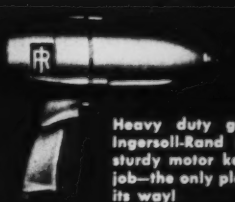
Scientifically designed and job-tested muffling eliminates unpleasant exhaust noise, in keeping with an industry and operator campaign for quieter and more efficient working areas!

BALANCED

Operator and industry alike benefit from the streamlined and well-balanced 5080 Impactool, when operator fatigue comes down, efficiency goes up.

COMFORTABLE

Comfort counts on production lines, so we've molded the handle of the 5080 to fit the hand. The convenient, easy to operate trigger is located for top comfort and control. When nuts must be run and removed, the easy to grip reverse cap speeds operation.



STURDY

Heavy duty gearing, the proven Ingersoll-Rand Impact Unit, and a sturdy motor keep the 5080 on the job—the only place any tool will pay its way!

POWERFUL

Powered by a long-life Multi-Vane air motor with extra wide vanes, the 5080 takes the tough jobs in its stride, making it first for power and dependability.

Offers a Complete Line of
Air and Electric Impactools
up to 4" bolt size capacity

Ingersoll-Rand

11 BROADWAY, NEW YORK 4, N. Y.

808-B

How to "cushion" your packaging problems

Nearly a ton and a half of shock absorbers meets its match in engineered-for-the-job H & D Pallet Paks. These cost-cutting corrugated boxes eliminate product damage, simplify materials handling, reduce freight charges, provide excellent "carry-ability" and tier three high. Get the most for *your packaging dollar* by consulting an H & D Package Engineer. His up-to-the-minute knowledge of modern materials handling methods can save you money.

Write for free 24-page book, "How To Ship Heavy Products In Corrugated Boxes." Hinde & Dauch, 5222 Decatur Street, Sandusky, Ohio.

H&D

HINDE & DAUCH

Authority on Packaging

FIRST TO MANUFACTURE CORRUGATED BOXES

Akron, Baltimore, Battle Creek, Mich., Bloomington, Ill., Buffalo, Chicago, Cincinnati, Cleveland, Columbus, Denver, Detroit, Fairfield, Conn., Findlay, Ohio, Gloucester City, N. J., Greensboro, N. C., Hoboken, Indianapolis, Jamestown, N. Y., Kansas City, Lenoir, N. C., Minneapolis, Omaha, Plymouth, Ind., Reading, Pa., Richmond, Va., Roanoke, Va., Rochester, Sandusky, Ohio, Shrewsbury, Mass., St. Louis, Toledo, Watertown, Mass.

Packaging Radioactives

A host of new problems confronts the packager who must ship fission materials

POSSIBILITIES offered by radioactive materials for developing new devices and techniques are tremendous, but many of them can't be used safely.

So said Paul Colsman, Isotopes & Special Materials Group, Brookhaven National Laboratory, when he developed the theme "Packaging in the Advancing Atomic Age" at the Packaging Institute's annual forum in New York Oct. 20-22. In addition to current packaging problems, special attention must be paid to a growing class of difficulties arising from shipment of radioactive materials, packagers were told.

Dangers in Handling — When these materials must be sent through normal channels, a multitude of personnel insufficiently trained and equipped may assist in handling. Their only protection is generally the package itself. Shielding is weighty, creating handling troubles galore. An average container shipped from Brookhaven weighs between 100 and 200 pounds and usually contains less than a gram of radioactive material.

Thus, wider industrial use of atomic energy promises a host of problems for packaging designers. Among the growing list of applications mentioned by Mr. Colsman are adoption of an alpha emitting isotope to dissipate static electricity by ionizing the air immediately surrounding; activation of phosphors, now done by radium and polonium; use on fluorescent tubes or in instruments containing radium sources, cold sterilization of drugs and foods, and industrial radiography.

Waste Disposal — Disposal of long-lived isotopes presents a problem to which there is no more immediate solution than that offered by controlled storage, says Mr. Colsman. He adds that shooting radioactive waste materials into space seems to be the most permanent answer, but probably will never be economically feasible.

To illustrate difficulties encountered, a radioactive isotope processing plant tour was conduct-

Look at that smooth finish . . .

it's CHASE® Free-Cutting Brass

Parts machined from Chase free-cutting brass, copper and bronze have a smooth, clean finish, free from rough edges. That means they're considerably less expensive to lacquer, enamel or plate. And because of their high strength and hardness, they will stand up under extensive handling and reuse. You'll get better quality production at lower unit costs when you use Chase free-cutting brass, copper and bronze. Fill in and send coupon below for free 56-page Chase book.

FREE Chase book discusses advantages, gives weights, properties and tolerances of Chase free-cutting brass, copper, bronze.

Chase BRASS & COPPER

WATERBURY 20, CONNECTICUT • SUBSIDIARY OF KENNECOTT COPPER CORPORATION

• *The Nation's Headquarters for Brass & Copper*

Albany†	Cleveland	Kansas City, Mo.	New York	San Francisco
Atlanta	Dallas	Los Angeles	Philadelphia	Seattle
Baltimore	Denver†	Milwaukee	Pittsburgh	Waterbury
Boston	Detroit	Minneapolis	Providence	
Chicago	Houston†	Newark	Rochester†	(†sales
Cincinnati	Indianapolis	New Orleans	St. Louis	office only)

Chase Brass & Copper Co., Dept. ST 1152
Waterbury 20, Conn.

Please send me free book "Chase Free-Cutting Brass, Bronze, Copper."

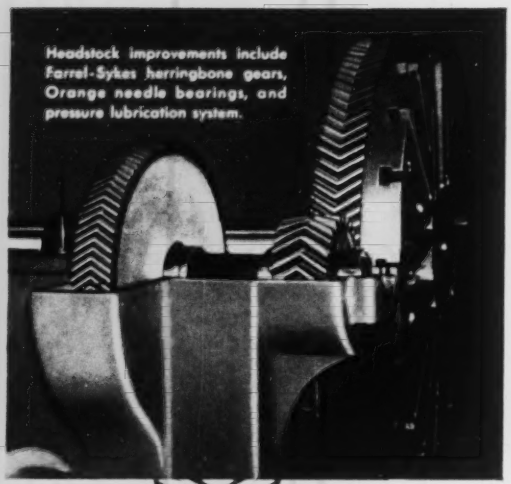
Name

Position

Firm

Address

City State


Headstock improvements include Farrel-Sykes herringbone gears, Orange needle bearings, and pressure lubrication system.

Huge, Rebuilt Lathe operates *Smoother Faster* with Farrel® Gears

In rebuilding a giant, 100" lathe, Simmons Machine Tool Corporation, of Albany, N. Y., used Farrel-Sykes herringbone gears to replace spur gears on the two final gear reductions.

With these new gears, new shaft bearings and a pressure lubrication system, Simmons was able to *double* the normal spindle speeds of the machine. Furthermore, on test, they found the rebuilt lathe to be "exceptionally smooth and quiet in operation for a machine of this size."

The quiet, vibration-free performance you can expect from Farrel-Sykes herringbone gears results from extreme accuracy of tooth spacing, contour and helix angle, and other qualities inherent in the Farrel-Sykes method of gear generation. They are made of the finest grade materials, in a complete range of sizes, for any power capacity and any application.

Wherever power transmission must be smooth and vibrationless under all conditions of load and speed, *specify Farrel herringbone gears.* Information and engineering assistance available, without obligation.

FARREL-BIRMINGHAM COMPANY, INC.
ANSONIA, CONNECTICUT

Plants: Ansonia and Derby, Conn., Buffalo, N. Y. • *Sales Offices:* Ansonia, Buffalo, New York, Boston, Pittsburgh, Akron, Detroit, Chicago, Memphis, Minneapolis, Portland (Oregon), Los Angeles, Salt Lake City, Tulsa, Houston, New Orleans

FB-76

Farrel-Birmingham®

Gay Tires

PLAID SIDEWALLS on your tires to indicate your clan—that's one possible application of a new color-transfer method. Process is called Anolith by American Anode, a division of B. F. Goodrich Co., Akron.

Multi-colored, printed, screened impressions can be transferred from paper to rubber or plastics in one operation. Patent rights are held by Soledad Co., Los Angeles.

An especially important feature is the possible application to conveyor belting.

ed via slides by E. E. Beauchamp, Radioisotope Development Department, Oak Ridge National Laboratory. Mr. Beauchamp demonstrated packages for radioisotopes shipment, and handling, storage and shipping methods employed at Oak Ridge.

High-Nickel Strip Available

High-nickel alloys, rolled to precision-tolerances and ultra-thin gages for use throughout industry are available from the Industrial Division, American Silver Co. Inc., Flushing, N. Y.

These metals, which include temperature compensation, low expansion, high permeability, glass sealing and electrical resistor alloys, are now rolled in strip up to 8 inches wide and down to 0.0005-inch with tolerances as close as plus or minus 0.0001-inch. The strip is available in any quantity from one pound to thousands of pounds.

110 Operations—38 Seconds

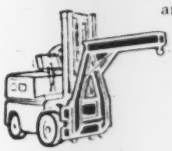
Part of a new high-production line for processing V-type automotive cylinder blocks, an 18-station automatic transfer machine, recently built by Greenlee Bros. & Co., Rockford, Ill., performs 110 machining operations in 38.3 seconds.

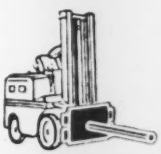
Drilling, reaming, boring, counter-boring and core-drilling operations are performed in machining banks, sides and starter-mounting pad of the blocks. Each working station can be reached from either side of the head for rapid changing and accurate setting of cutting tools.

The World over... Multiply Your Storage Space by using CLARK EQUIPMENT

This is the modern method by which alert business men throughout the world are satisfying the need for increased storage space without investing a penny in building costs: the Clark method of materials handling.

Clark fork-lift trucks enable you to utilize your "air rights"—by putting idle space near the ceilings to profitable use. They promote orderly efficient warehouse planning—every commodity in its assigned place. Materials move into and out of storage a great deal faster—making it easy to handle a far larger volume of goods. Accidents and damage losses are sharply reduced. Using unit loads composed of multiple items save much time in taking inventory. Actually, storage capacity is usually doubled, in many instances tripled, by carefully planned use of these powerful, fast, safe, efficient machines.





For full information on this more efficient modern method, consult the Clark dealer in your area. You'll find him a competent counselor on all problems of handling materials at lowest cost. Call him today—he's listed under "Trucks—Industrial" in the yellow pages of your phone book.

CLARK ELECTRIC AND GAS POWERED FORK TRUCKS
AND POWERED HAND TRUCKS • INDUSTRIAL TOWING TRACTORS

INDUSTRIAL TRUCK DIVISION • CLARK EQUIPMENT COMPANY • BATTLE CREEK 26, MICHIGAN
Please send: ☐ Material Handling News ☐ Condensed Catalog
Name_____
Firm Name_____
Address_____
City_____ Zone____ State_____
AUTHORIZED CLARK INDUSTRIAL TRUCK PARTS AND SERVICE STATIONS IN STRATEGIC LOCATIONS

JUST as the professional architect saves by proper planning and supervision when you build a home or factory—so will experienced engineers at Worcester Stamped Metal, save time and money, when you plan parts or products shaped from metal.

Here, trained craftsmen use both technical and practical knowledge to design and build tools that will eliminate unnecessary operations and develop the greatest operating efficiency. These tools are put to work on the most modern equipment, to produce light, heavy and deep drawn stampings from any of the common metals and alloys—for "on-time" deliveries.

If you have a metal stamping problem . . . it will pay you to investigate this complete and dependable service.

WORCESTER STAMPED METAL ©

WORCESTER STAMPED METAL Company

10 HUNT ST., WORCESTER, MASS., U. S. A.

SPECIALISTS IN SKILLED STAMPING SERVICE

New Bridge Gets Army OK

ARMY ENGINEERS with an assist from private industry have developed a new aluminum fixed bridge. Called the T6, it can be erected faster than any other heavy tactical bridge, can support 50 per cent greater loads, and with minor changes in the field, it can be made strong enough to carry a full-dress army instead of that employed by a division.

Five years of co-operative work by Army Engineer Research and Development Laboratories, Aluminum Co. of America, and Pittsburgh-Des Moines Co., went into the development and testing of a pilot model of the bridge. So successful were tests on the T6 that the Army now has the bridge under procurement.

Less Weight—A 75-foot length of the new bridge is reported to be erected in approximately one-third the time required for the same length of Bailey bridge. Weighing 40 per cent less than a comparable steel bridge, it is simple in design and, maintaining division load capacity, the T6 can span approximately 180 feet.

Ordinarily the heavier equipment of an army cannot be transported over a division bridge, but by adding extra panels to the T6 it is quickly adapted to the greater capacity.

Sheet Slide Rule Improved

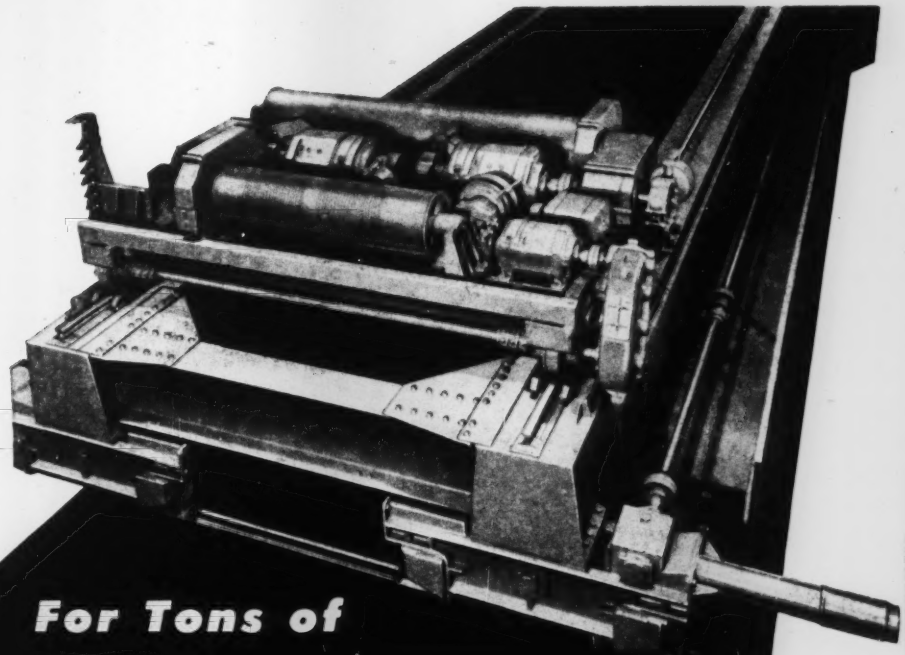
A new improved slide rule weight calculator for all flat sheet material is available from the Dayton Rogers Mfg. Co., Minneapolis 7.

Knowing width of the sheet or strip, and pitch or number of lineal feet required for 1 to 100 pieces, the exact overall weight is easily determined. A weight calculator that gives constants for sheet copper, bronze, aluminum, lead and steel is also provided. Slide rules are available free of charge by writing on official company letterheads.

New Booklets On Boiler Water

Two technical publications on boiler waters are announced by the E. F. Drew & Co., New York.

Offered without charge is a 12-page catalog outlining difficulties caused through industrial wa-



For Tons of EXPERIENCE

53 Years

When you install a Northern Overhead Electric Traveling Crane or heavy duty Hi-Lift Hoist you are utilizing the full benefit of our 53 years experience as crane builders for many of the most efficiently operated and competitive companies in American industry.

One of these companies has installed over 700 Northern Cranes in its many plants for a wide range of material handling usage — adding up to an amazing tonnage in capacity, and in experience!

It takes the best experience available to tool properly to remain competitive today. Northern Cranes can safely assure you a satisfactory, dependable, long-term tooling investment based on tested, seasoned experience.

Write for new Super-Crane Bulletin No. SE-108-161 for information and major specification details of Northern Super-Cranes and Super-Trolleys.

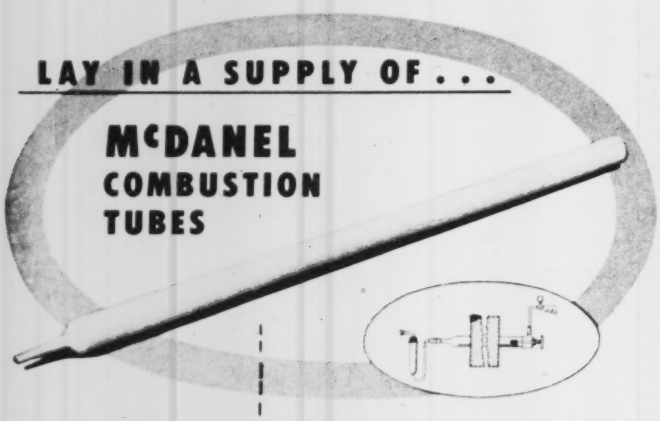
NORTHERN ENGINEERING WORKS

General Offices: 2615 Atwater St., Detroit 7, Michigan

BUILDERS OF CRANES AND HOISTS EXCLUSIVELY

LAY IN A SUPPLY OF . . .

McDANEL COMBUSTION TUBES



FEWER FAILURES: MORE DETERMINATIONS

McDanel Refractory Porcelain Co.
Beaver Falls . . . Penna.

McDANEL PORCELAIN SPECIALTIES
Your Porcelain requirements—large or small —are considered important by McDANEL.

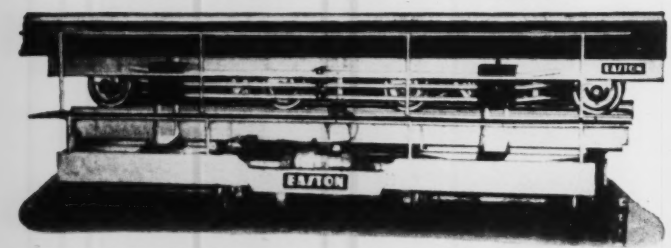
A-1033

EASTON

EASTON experience covers small and large capacity furnace cars for every requirement.

Furnace Cars

Electric furnace car mounted on electric transfer car for completely automatic continuous heat treating system.



EASTON CAR & CONSTRUCTION COMPANY · EASTON, PA. · NEW YORK · PHILADELPHIA · PITTSBURGH

Ribs for a Heavyweight

Welders join ribs and sides of a stator section in building General Electric Co.'s biggest 3600-rpm generator. The unit will be shipped from GE's Schenectady turbine plant to the Joppa, Ill., station run by Electric Energy Inc. Four generators, each with 216,000-kva rating are on order

ter contamination, recommended treatments for scale, sludge, corrosion, carryover and other boiler methods.

The other, a 57-page booklet titled "Industrial Water Analysis," covers in detail boiler water sampling, expressions of results, test equipment and general water analysis. Versenate hardness, dissolved oxygen, total solids, steam purity, corrosion and other special tests are also outlined. The latter publication is available at $1 per copy.

New Data for Small Plants

Two leaflets designed to aid small business men, one on "Machining, Repairing and Heat Treating Cast Iron Work Pieces," and the other "Reducing Accidents Through Reports and Records," were issued recently by the Small Defense Plants Administration, Washington.

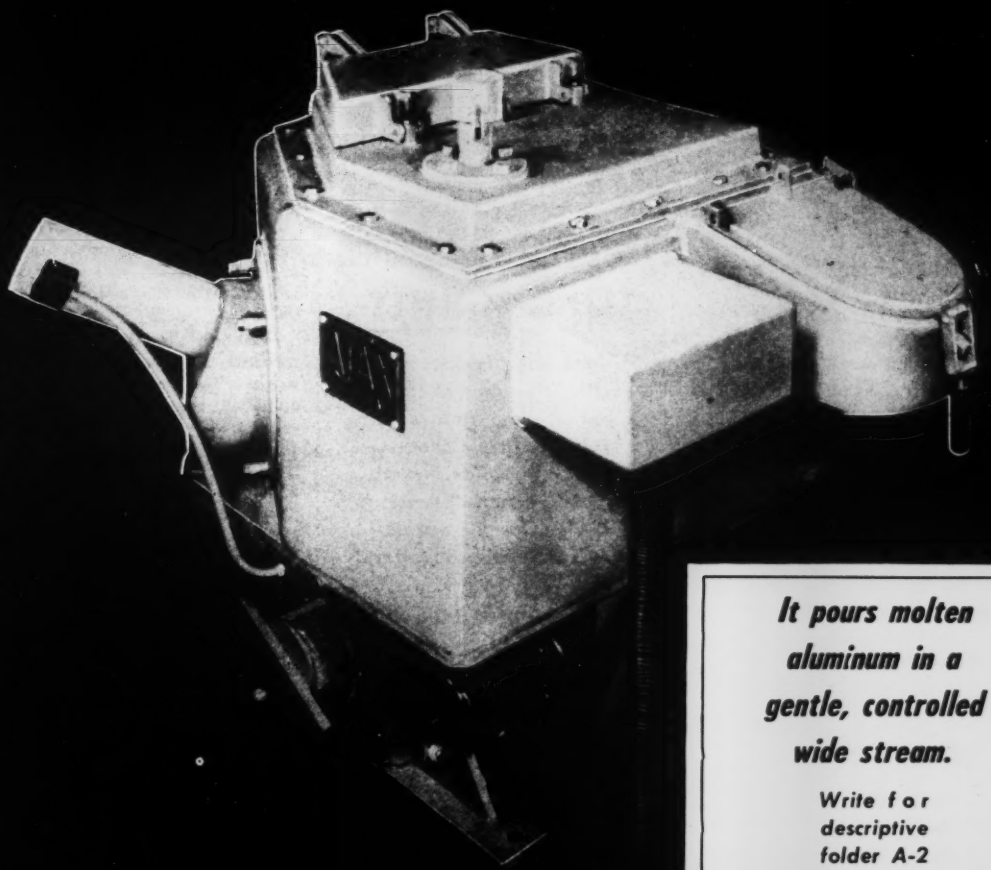
Both leaflets are available free from SDPA field offices.

Tough Plastic for Industry

Heavy industrial use of plastics took a step forward last month when American Lucoflex Inc. introduced a large ventilating fan made entirely of its unplasticized,

AJAXOMATIC

AN AUTOMATIC POURING UNIT FOR THE PRODUCTION OF ALUMINUM DIE CASTINGS

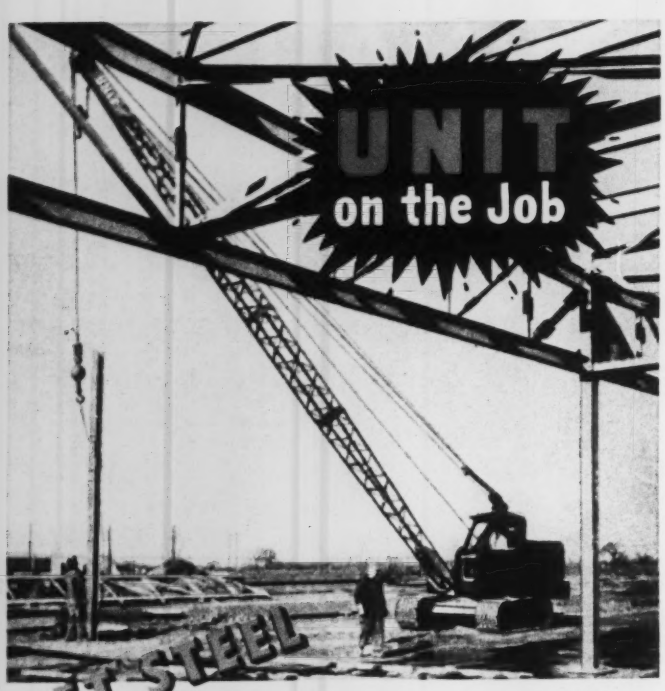


It pours molten aluminum in a gentle, controlled wide stream.

Write for descriptive folder A-2

AJAX ENGINEERING CORPORATION

TRENTON, N. J.



SET STEEL - *Easy and Fast with* **UNIT**

Lifting, carrying and spotting steel girders into the exact position requires STABILITY — FLEXIBILITY and PERFECT CONTROL. A UNIT Crane gives you all these features . . . and more. Extra Long Crawlers — Multiple Hinged Shoes — Wide Axles and Hook Rollers provide perfect stability. Smooth accurate control of boom and hoist lines permits precision handling. UNIT'S FULL VISION CAB gives the operator excellent visibility . . . makes steel setting jobs easier and faster. UNIT equipment can be quickly and easily converted to handle a wide variety of work. To speed up your steel construction, investigate UNIT. Write for literature.

UNIT CRANE & SHOVEL CORPORATION
6521 WEST BURNHAM STREET • MILWAUKEE 14, WISCONSIN, U. S. A.

½ or ¾ YARD EXCAVATORS...CRANES UP TO 20 TONS CAPACITY
CRAWLER OR MOBILE MODELS . . . GASOLINE OR DIESEL

All Models Convertible to ALL Attachments!

hard polyvinyl chloride material. Even the blades are made of the plastic. Operation is said to be as efficient as that of a metal fan.

The plastic is available as a bulk resin which may be extruded, or in sheets, rods and tubes for machining, forming or welding. It is translucent in thin sections, opaque in thick sections and is free from taste, odor and toxicity.

Tube Forge Process Saved

A KENTUCKY manufacturer was at the point of abandoning a newly developed continuous forging process for turning out extra heavy tubing for high pressure gas and oil pipes. Lack of suitable lubricant caused excessive breakage and wear to the expensive mandrels.

In the process heated tubing is forced over the mandrel, forging it to proper curvature of bend, retaining its initial diameter and wall thickness. Hydraulic pressures of about 1800 psi were required in the operation before an Aquadag solution was used as a lubricant for the inside walls of the tubing.

Indefinite Life — A product of Acheson Colloids Co., division of Acheson Industries Inc., Port Huron, Mich., Aquadag enabled pressures to be reduced to as low as 400 psi. Mandrels which were good for the production of only 6 to 30 pieces previously, have produced as many as 600 heavy pieces and are reported to have an indefinite life for production of the lighter tubings.

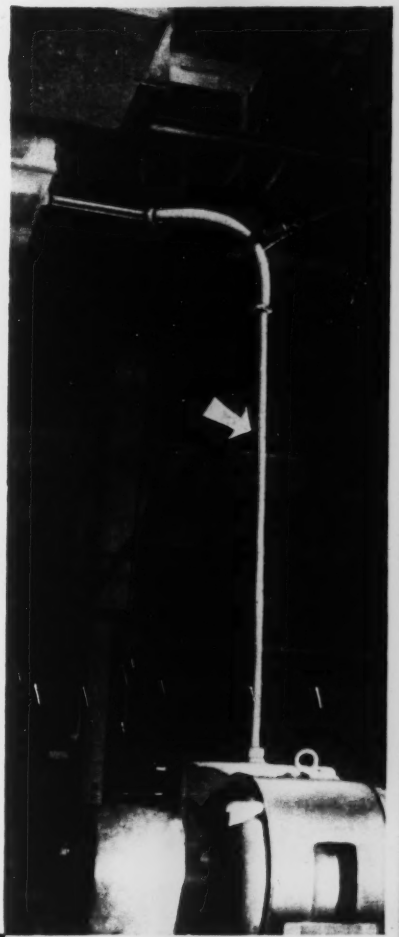
A dilute solution of Aquadag in water is used to swab the inside of the tubings. The water evaporates quickly and leaves a homogenous film of soft colloidal graphite.

Wayne Gets New Computer

Wayne University's computation laboratory program is now in full scale operation. Soon to be added to the laboratory's present analogue machines is a large-scale digital computer, being built by Burroughs Adding Machine Co.

Supported by local business and industry, the lab program is expanded to include training and research in all areas related to ma-

How High Standard Mfg. cuts costs by using POWERDUCT from busduct to machine



"Powerduct Cable means a big saving for us," says Frederick Lynn, chief electrician at The High Standard Mfg. Corp., Hamden, Conn., makers of Hi-Standard firearms, internationally famous for their accuracy and painstaking craftsmanship.

"You'd be surprised that a very big item is being able to use Powerduct over and over again as production increases and model changes are made. Twelve feet, fifteen feet, it doesn't make any difference. I'm able to use it any place. Powerduct is never wasted. That's why it's less expensive.

"Because busduct with Powerduct means complete flexibility, we increase the use and mobility of the machine. Our crew saves many man-hours by being able to plug in Powerduct instead of wiring a whole rigid conduit system."

"For heavy equipment we plug the cutout in the busway and run the Powerduct almost directly to the machine. It's not likely this machine will be moved, so the usual loop is not necessary."

"Here's the installation for lighter equipment. By varying the size of the loop I can move the machine."

Powerduct complies with Section 3646 to the 1951 National Electrical Code.

Powerduct has full Underwriters' approval, costs less than any other approved type of cable. For further details on Powerduct, contact your nearest Anaconda Distributor or Anaconda Sales Office—or write to Anaconda Wire & Cable Company, 25 Broadway, New York 4, N. Y.

52378

the right cable for the job ANACONDA® wire and cable

You can't beat a WHEELABRATOR® for SPEED cleaning

Another example of COST CUTTING PERFORMANCE

In just 12 seconds badly rusted and corroded steel drums are cleaned down to the virgin metal in an airless Wheelabrator at a drum reconditioning plant. No other method provides the surface cleanliness required, at this amazing production speed, for protective and decorative coatings.

WHAT IS YOUR PROBLEM?

For your metal cleaning and finishing problem, it will pay you to investigate the time-and-money-saving benefits of the Wheelabrator. Its applications are unlimited. For example, removing flux and spatter from weldments; etching steel mill rolls; deflashing molded plastic parts; removing mica from molded rubber; to name just a few. Write for details today.

FOR BEST RESULTS

Use TRU-STEEL SHOT in your blast cleaning machine. It has the endurance that only steel can give. Results: Outstanding reductions in cleaning costs.

WHEELABRATOR—The perfected airless centrifugal blast unit pioneered by ***American*** slashes cost and cleaning time. Conserves power, labor, space. Cleaning perfection results in longer tool life, faster machining and grinding, easier inspection.

American
WHEELABRATOR & EQUIPMENT CORP.
509 S. Byrkit St., Mishawaka 2, Indiana

Portable Samson

IF YOU NEED a heavy-duty mobile cargo lift, take cheer. The armed forces have one with a 13,000-pound capacity.

Elevator will be able to hoist vehicles and heavy freight into planes, then unload the same cargo hours later half way around the world. Wheels retract during lifting operations and the lift stands on four self-contained jacks with large treads.

Engineers at Lockheed Aircraft Corp., Burbank, Calif., say the whole hoist can be knocked down for transporting, or while intact rolled from spot to spot on its wheels.

So far it's for the military, but the idea no doubt will expand to include industrial models.

chine computation. In addition to training and research uses by the university, the new machine will be made available for business and industrial problems.

Chase Offers New Alloy

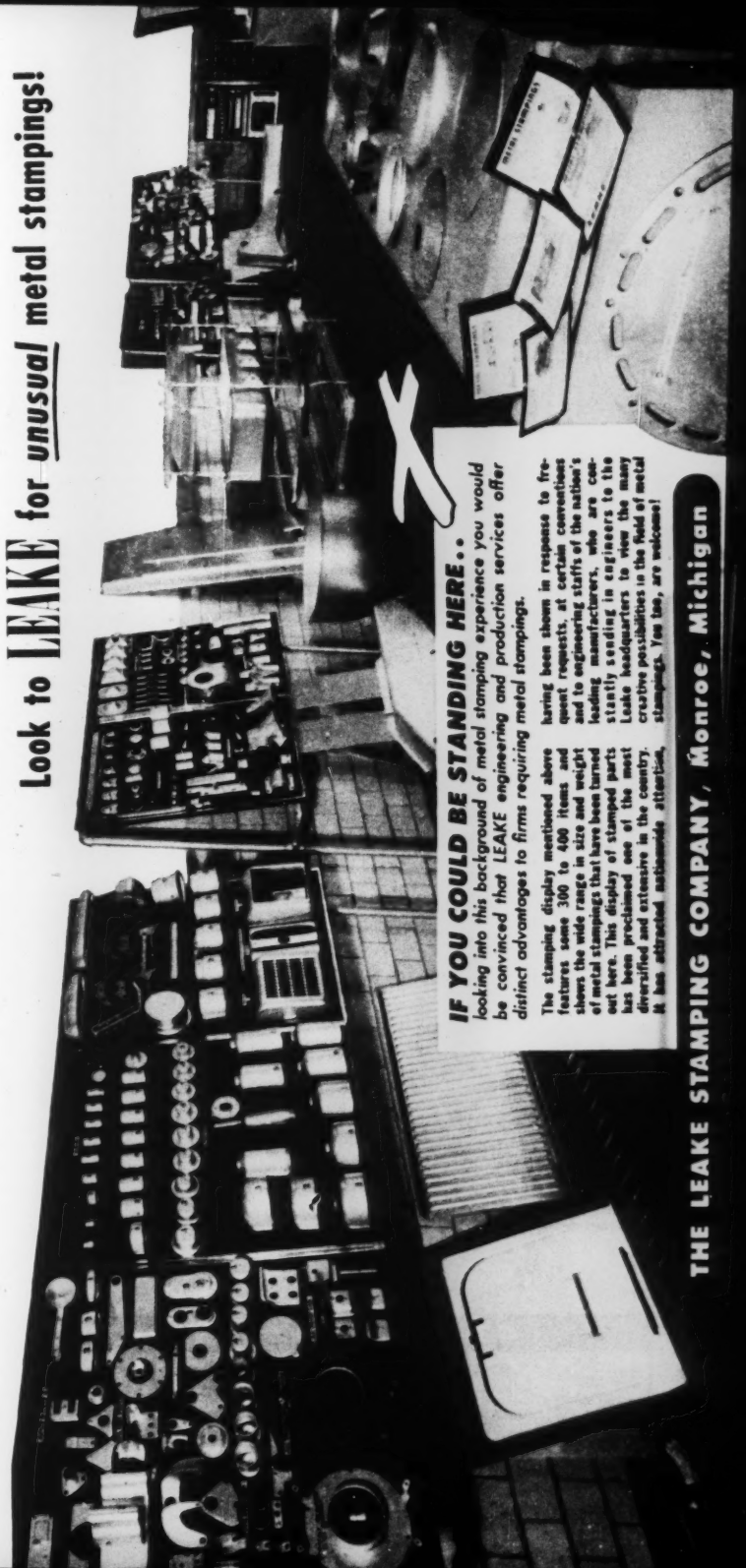
A COPPER-BASE alloy utilizing controlled amounts of tellurium, nickel and phosphorus is available from Chase Brass & Copper Co., Waterbury, Conn. Said to combine the properties of excellent machinability, hot and cold workability, good electrical conductivity, high strength, age-hardenability, high fatigue strength and good corrosion resistance, the patented alloy is called "Telnic" bronze.

Accurately proportioned amounts of nickel and phosphorus give Telnic bronze the good electrical and physical properties and the suitability for hardening by heat treatment. Good machinability, equal to 80 per cent of free-cutting brass, is obtained by the addition of a controlled amount of tellurium which does not present the disadvantage of hot shortness characteristic of leaded, high copper alloys.

Special Tempers Available— While it is normally supplied with hard drawn temper or forging temper, the alloy may be obtained with special tempers to meet unusual requirements.

Typical uses of Chase Telnic bronze include forgings and screw

Look to LEAKE for *unusual* metal stampings!

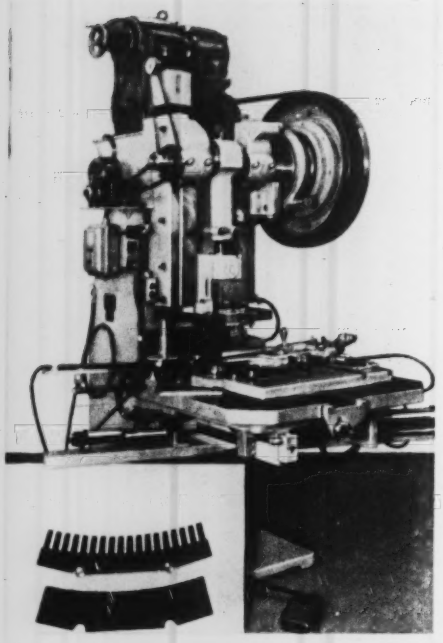


IF YOU COULD BE STANDING HERE..
looking into this background of metal stamping experience you would be convinced that LEAKE engineering and production services offer distinct advantages to firms requiring metal stampings.

The stamping display mentioned above features some 300 to 400 items and shows the wide range in size and weight of metal stampings that have been turned out here. This display of stamped parts has been proclaimed one of the most diversified and extensive in the country. It has attracted nationwide attention, having been shown in response to frequent requests, at certain conventions and to engineering staffs of the nation's leading manufacturers, who are constantly sending in engineers to the Leake headquarters to view the many creative possibilities in the field of metal stampings. You too, are welcome!

THE LEAKE STAMPING COMPANY, Monroe, Michigan

New V & O Notching

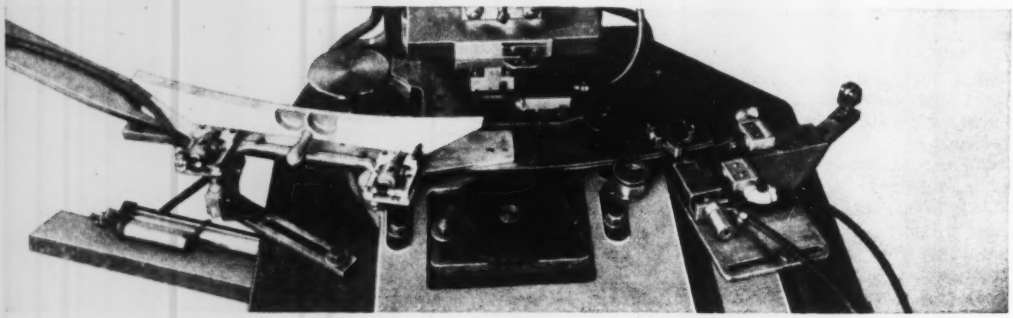


These new V & O machines consist of (1) a segmental notching press of advanced design and (2) a high speed notching press featuring a roller gear drive for more accurate indexing.

Both developments provide improvements that assure greater precision in spacing than has been available heretofore. This improved accuracy at the press cuts production costs and helps speed motor assembly. Slot alignment in stacked laminations is uniformly even, minimizing filing and drifting as operations and production expenses.

NEW V&O SEGMENTAL NOTCHER

Self-Indexing (No index segment).
Produces rotors or stators.
Semi-automatic — operator merely loads and unloads.
Slot spacing adjustable without tooling change.
Variable speed drive — control press speed to suit job.
Punch half slots or half poles without change in tooling.
Reduced set-up time.
Vernier adjustment for slot spacing.



Lamination blank is carried on an adaptor plate mounted on a master segment. Air cylinder moves the blank in circular path past the die.

OTHER EMHART PRODUCTS INCLUDE:

HIGH SPEED AUTOMATIC PRESSES
HENRY & WRIGHT
Division of Emhart Mfg. Co.
HARTFORD 5, CONNECTICUT

GLASS MAKING MACHINES
HARTFORD-EMPIRE CO.
Division of Emhart Mfg. Co.
HARTFORD 2, CONNECTICUT

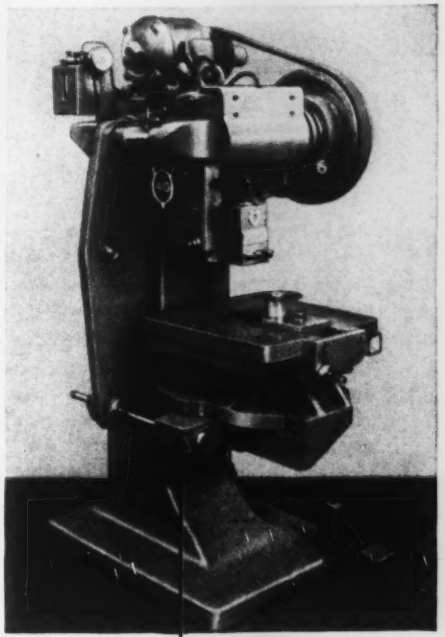
AUTOMATIC PACKAGING EQUIPMENT
STANDARD-KNAPP
Division of Emhart Mfg. Co.
PORTLAND, CONNECTICUT

PLASTIC BOTTLES, RODS, TUBES, SPECIAL SHAPES
PLAX CORPORATION
Subsidiary of Emhart Mfg. Co.
HARTFORD 1, CONNECTICUT

Presses *assure uniform, accurate spacing... slots always line up...filing minimized*

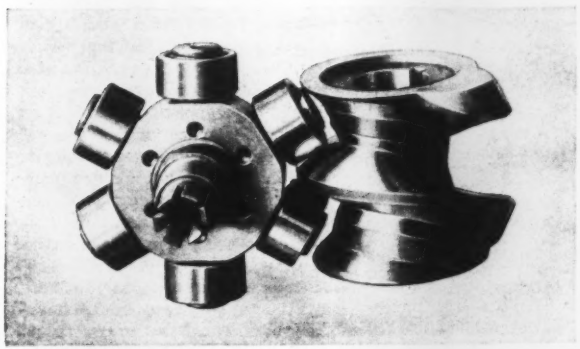
Other advantages of the new notchers are that they are easy to adjust for any notch combination, even prime numbers; require less downtime for changes and thus afford higher productivity over a given period of operation.

You know how much it costs now to produce and assemble laminations. These new notchers will help you realize substantial savings at the press and in subsequent production operations. Find out for yourself by getting the complete facts from V & O.



ROLLER GEAR NOTCHER

Unusually low maintenance — reduced hazards to dies.
Higher degree of precision.
Wider range of notch combinations with fewer set-up parts.
Precise, positive indexing.
Low inertia indexing — 50% lower than standard.
More production per machine.

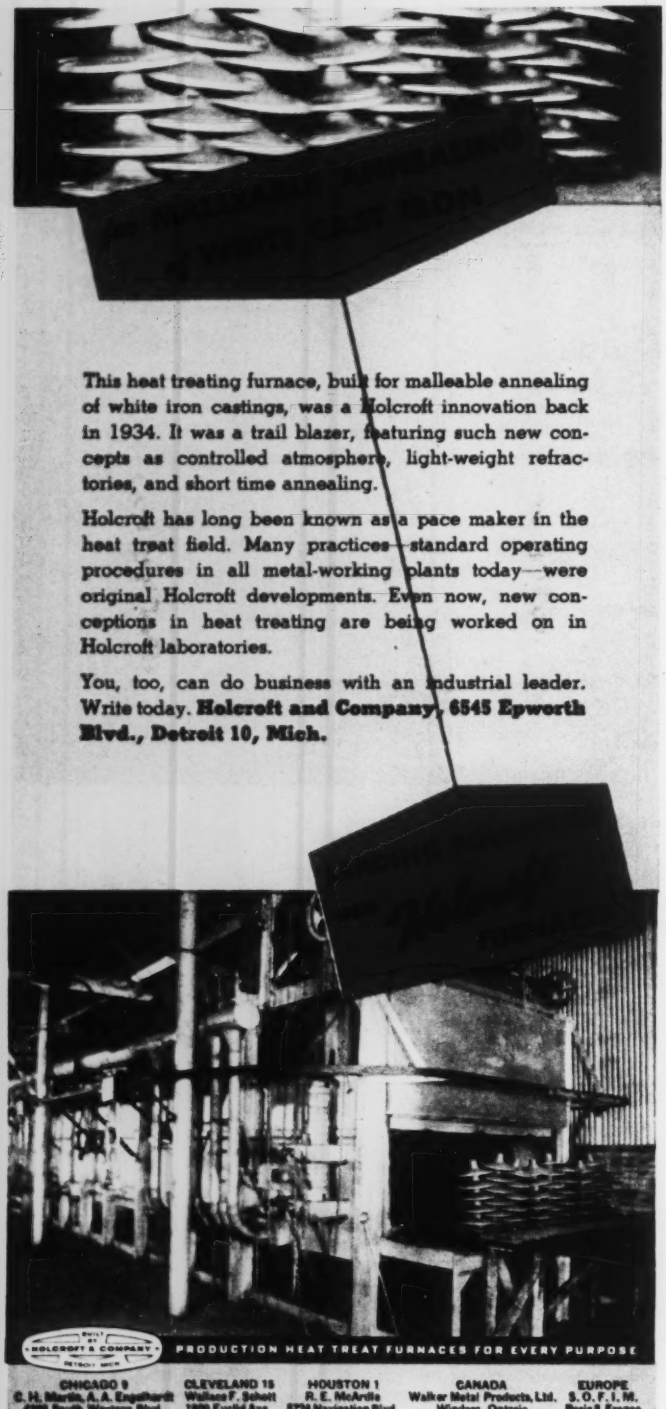


Roller gear, showing spider and cam. Preload of bearings on cam results in positive dwell while punching.

Only the best is good enough

DESCRIPTIVE CATALOGS Catalogs containing complete specifications and operating details on V & O Precision Power Presses and Feeds are available. Please write The V & O Press Company, 381 Union Turnpike, Hudson, N. Y.

THE V & O PRESS COMPANY
Division of Emhart Mfg. Co.
BUILDERS OF PRECISION POWER PRESSES AND FEEDS SINCE 1889
HUDSON NEW YORK



This heat treating furnace, built for malleable annealing of white iron castings, was a Holcroft innovation back in 1934. It was a trail blazer, featuring such new concepts as controlled atmosphere, light-weight refractories, and short time annealing.

Holcroft has long been known as a pace maker in the heat treat field. Many practices—standard operating procedures in all metal-working plants today—were original Holcroft developments. Even now, new conceptions in heat treating are being worked on in Holcroft laboratories.

You, too, can do business with an industrial leader. Write today. **Holcroft and Company, 6545 Epworth Blvd., Detroit 10, Mich.**

BUILT BY HOLCROFT & COMPANY DETROIT, MICH.

PRODUCTION HEAT TREAT FURNACES FOR EVERY PURPOSE

CHICAGO 9 — C. H. Martin, A. A. Engelhardt, 4259 South Western Blvd.
CLEVELAND 15 — Wallace F. Schott, 1909 Euclid Ave.
HOUSTON 1 — R. E. McArdle, 5724 Navigation Blvd.
CANADA — Walker Metal Products, Ltd., Windsor, Ontario
EUROPE — S. O. F. I. M., Paris 8, France

machine parts. It is supplied as round rods $1\frac{1}{8}$-inch to $1\frac{3}{4}$ inches in diameter, or as hexagonal rods measuring 3 16-inch to $1\frac{1}{4}$ inches across flats.

Steelmaking Timesavers

AISE told to watch the little things; cut open hearth downtime after rebuilds

SAVING MINUTES in some operations, planning certain steps at furnaces, and watching furnace temperatures more closely are a few of the "little things" that can be done to spot production capacity hidden away in existing mills. So said T. J. McLoughlin, assistant to the vice president-manufacturing, U. S. Steel Corp., when he addressed the Pittsburgh regional technical meeting of American Iron and Steel Institute recently.

Improved practices in each stage of the operation boosted monthly production 21 per cent in one U. S. Steel open hearth mill, he revealed, even though size of the heats remained the same. Such improvements could be made industry-wide, he maintained, if every effort were made to reduce charging time, repair time, and time-consuming incidental operations.

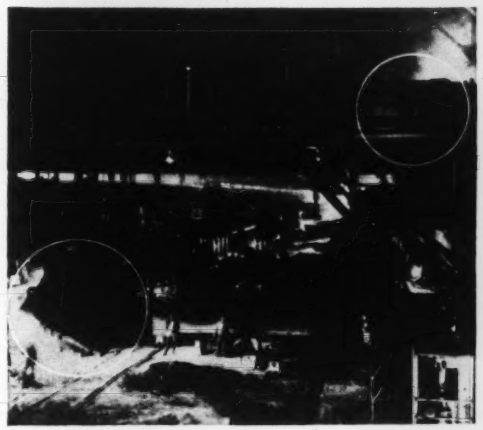
More Tips — Some plants now maintain maximum fuel input while open hearth doors are open so that proper temperatures are not lost. Spotting equipment in the proper place in advance of requirement, and evenly-distributed charging also save production minutes. Some steel makers now start between-heat repair of furnace ends while a heat is being tapped, the author reported.

Open hearth heat time, formerly considered standard at 12 hours, has been consistently cut to under 10 hours in one plant, and the ideal heat time—$8\frac{1}{2}$ hours from tap-to-tap—can be achieved with a higher percentage of hot metal, he maintained.

Less Downtime — Steelmakers attending the session also heard Hobart N. Kraner and Charles N. Jewart, ceramic engineers, Bethlehem Steel Co., report that projection of their firm's schedule to speed open hearth heating after

LARGE TUBE MANUFACTURER Uses DRAVO

CRANE CAB COOLERS IN OPEN HEARTH OPERATIONS



CAB TEMPERATURE REMAINS CONSTANT; DUSTS, FUMES, GASES, DIRT ELIMINATED

In open hearth charging operations, crane cab operators are subject to heat from 135° to 150° F., plus such nuisances as dusts, fumes, gases and dirt. To eliminate such unpleasant working conditions, this large tube manufacturer has installed Dravo Crane Cab Coolers on open hearth charging cranes.

Results: cab temperatures constant at 80° to 85° F., winter or summer; healthier workers and more efficient operations.

CRANE CAB COOLERS HAVE LONG SERVICE LIFE, PROVIDE YEAR-'ROUND AIR CONDITIONING

Dravo Crane Cab Coolers are ruggedly constructed, factory assembled and pretested to provide years of more-than-satisfactory service. All equipment in the unit is readily accessible with ample space for quick and efficient maintenance.

In the various air conditioning functions the crane cab cooler not only filters the air, removes dust, dirt and fumes, but heats the cab in winter, cools it in summer and provides constant ventilation the year around.

AVAILABLE IN SINGLE UNIT OR IN SPLIT-TYPE UNIT; IMMEDIATE DELIVERY

Dravo Crane Cab Coolers are built in two models—the self-contained unit, mounted on any available space on the crane and the new split-type unit where the condenser section is mounted on the crane, with the conditioning section in the cab.

The Dravo Crane Cab Cooler can be easily and quickly installed on any type of crane with a minimum of down-time required. Units are available now! Write for more information—or phone the nearest Dravo Office and have our representative call on you.

DRAVO CORPORATION

606 Dravo Building, Fifth & Liberty Avenues, Pittsburgh 22, Pa.

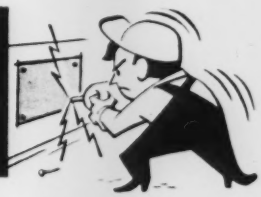
ATLANTA • BOSTON • CHICAGO • CLEVELAND • DETROIT
NEW YORK • PHILADELPHIA • PITTSBURGH

To identify... specify

C&H Metal-Cal*

...The permanent, self-adhesive identification device

NO DRILLING, SCREWS OR RIVETS

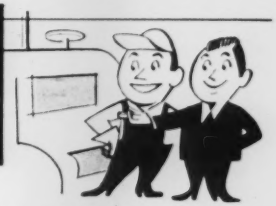


A METAL-CAL is a .003" thickness of aluminum foil—anodized, dyed and backed with a high tensile bonding material. Easily applied to any smooth, cohesive surface. Slashes labor and material costs of conventional nameplates.

WON'T PEEL, CHIP OR CRACK

Letters, colors and characters on a METAL-CAL live as long as the metal itself . . . survive the most trying conditions of weather and wear. The best of decals and litho-plates can't match the performance of a METAL-CAL.

TREND IS TO *Metal-Cals!*



Industrial use of METAL-CALS for permanent, distinctive identification spreads wider every day. Names of dozens of "big-name" manufacturers who now use METAL-CALS are available on request.

Main Office and Factory:
Boeing Field
Seattle 8, Washington
Office and Factory:
415 E. Beach Ave.
Inglewood 3, Calif.
Office: **1725 E. 2nd St.**
Wichita, Kas.

Representatives in all principal cities

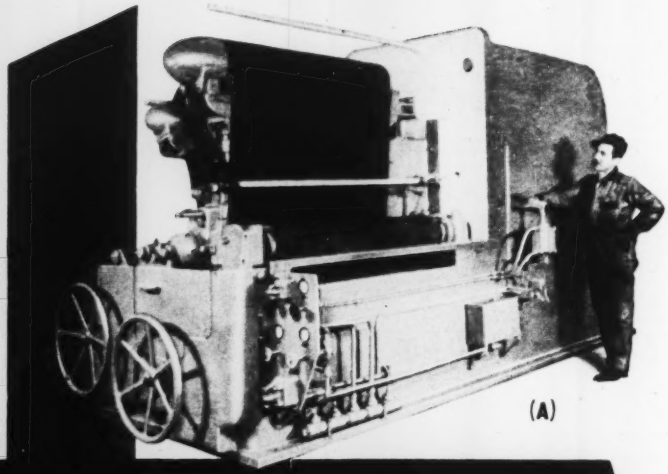
FOREIGN LICENSED MFRS.
Metal-Cal, Ltd.,
Vancouver, B. C.
Malby & Son, Ltd.,
Hove Sussex, Great Britain

C&H Metal-Cal

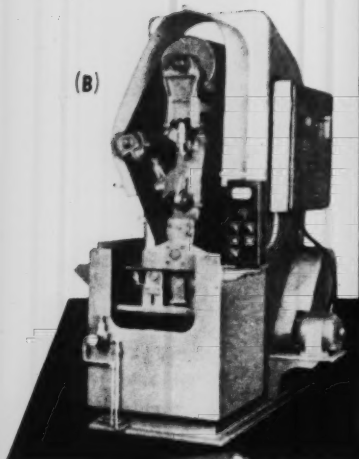
Trade Mark registered.
Patented in U. S. and Foreign Countries.

For further information and quotes, address all inquiries to

C & H Manufacturing Co.
Dept. M3, Boeing Field, Seattle 8, Wash.



(A)



(B)

IF THE STOCK IS FLAT
MICRO-POLISH

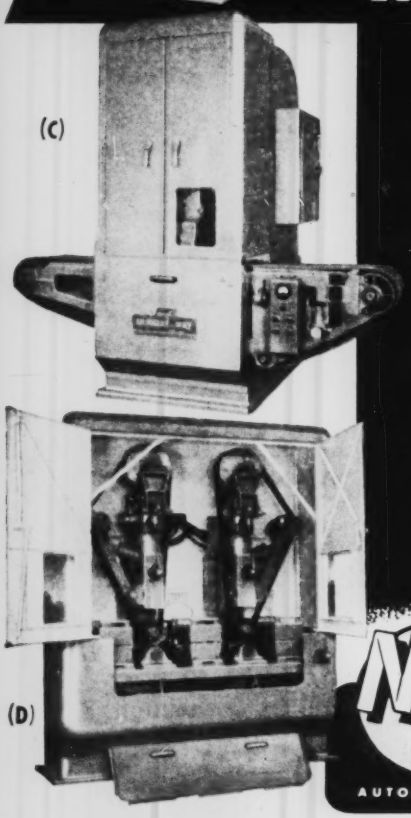
can automatically finish your job faster, better or cheaper regardless of size, shape or material.

Murray-Way, "engineered-to-the-job", Micro-Polish equipment is now being used the country over in every type of application, on every conceivable kind of material.

Micro-Polish is an amazingly versatile and consistently successful automatic polishing method useful on any job from the prepolishing of low grade steel sheet, to meet high quality job specifications, to the production sharpening and polishing of pruning tools.

Micro-Polish can precision finish any size, shape or length of sheet, strip or blanked stock in ferrous or non-ferrous metals, wood, fiber, plastic, rubber or leather, by wet or dry process.

The typical Micro-Polish equipment shown here demonstrates how Murray-Way engineers have adapted the process to individual job requirements.



(C)

(D)

A Micro-Polish giant used in reclamation grinding of steel strip.

B One of our smaller units used in polishing narrow bi-metal stock.

C A versatile unit using belt conveyor to polish a variety of flat stampings and forgings.

D A space saver unit for polishing flat bar stock. Two heads and two grades of belt grain accomplish the complete job without rehandling.

Murray-Way engineers will gladly show you how this time and cost saving method can improve your polishing operation.

MURRAY WAY

THE MURRAY-WAY CORPORATION

POST OFFICE BOX 180 — BIRMINGHAM, MICHIGAN

AUTOMATIC POLISHING, BUFFING, GRINDING EQUIPMENT

Practical Field Work

New wrinkle in Air Force Engineers' training passes its initial phase as the steel structure of a 495,000-sq ft warehouse goes up at Marietta, Ga. AF engineers are doing the erecting as a training project, then will turn the building over to Lockheed Aircraft Corp. Luria Engineering Co. shipped the standardized structure by rail from its Bethlehem, Pa., plant

rebuilding could up annual national capacity substantially. The authors based their claim on the assertion that silica brick used to line some furnaces may be safely reheated more rapidly than is common practice in the industry.

A furnace that can tap the first heat 20 hours after the bricklayers are through will produce over 4 heats while those which are heated in the usual 50 hours are producing their first heat. Using this improved heating schedule, the Lackawanna plant of Bethlehem Steel Co. produced at least 25,000 extra net tons in 1951, according to the authors.

Time Varies—A survey of the industry showed that the time taken to put an open hearth furnace into production after rebuilding varied from 18 to 108 hours. By carefully controlling temperatures within their furnaces and by taking advantage of other means of improvement, Bethlehem last year averaged 22 hours and 22 minutes from repair to first tap.

To illustrate their theme, Messrs. Kraner and Jewart say the equivalent of the production of five additional 200-ton open hearth fur-

How *SPEED CASE* Boosted A Valve Maker's Sales!

These "Seat-Seal" Valves are used by petroleum refiners. Sales competition is stiff and they have to be better than good, holding bubble-tight for thousands of openings and closings under a pressure of 2000 p.s.i.g. Nearly 300 of them are shown on a Texas tank car loading rack.

Holliday's Speed Case (X1515), one of the "Time-Saver" Speed Steels, is used to make the valve bodies. Its outstanding machinability and smooth finishing characteristics are making possible operations under this sustained high pressure . . . at costs well within Grove's competitive market. "The free machining qualities of Speed Case assist materially in enabling us to maintain our competitive position in a highly competitive market," reports Grove Regulator Company, Oakland, Calif., manufacturer of the valves.

Perhaps your own needs can be profitably served by these versatile steels. While demand often exceeds supply, it will pay you to check with your Speed Steel Distributor today. W. J. Holliday & Co., Inc. Speed Steel Plate Division, 120 139th St., Hammond, Indiana.

SPEED STEELS

SINCE 1886 W. J. HOLLIDAY & CO.

DISTRIBUTED BY

Brown-Wales Co., Cambridge-Hartford-Auburn, Me. - Bridgeport Steel Co., Milford, Conn. Beals, McCarthy & Rogers, Buffalo, N. Y. - Burger Iron Co., Akron, Ohio - Grammer, Dempsey & Hudson, Inc., Newark, N. J. - Earle M. Jorgensen Co., Los Angeles-Houston-Oakland-Dallas - Passaic County Steel Service, Inc., Paterson, N. J. - Peckover's Ltd., Montreal-Toronto - Peninsular Steel Co., Detroit, Mich. - Pidgeon-Thomas Iron Co., Memphis, Tenn. - Horace T. Potts Co., Philadelphia-Baltimore-York, Pa.

Produced by W. J. Holliday & Co., Inc., Speed Steel Plate Division, Hammond, Indiana. Plants: Hammond and Indianapolis, Indiana

Is your present abrasive method

Only CARBO

TRADE

"Carborundum" is a registered trademark which indicates manufacture by The Carborundum Company, Niagara Falls, New York

really good enough, today?

Chances are good that if you've been using the same method for a mere two years, there's now a better way. That's how thick and fast the new developments in abrasive techniques have come along. Every day someone, somewhere, is switching from one method to another, under the pressure of one hard economic fact: the need to cut costs.

Here lies the biggest advantage to the shop which has standardized on abrasives by CARBORUNDUM. You get counsel free from bias, for the CARBORUNDUM distributor or salesman represents the only producer of a complete branded abrasives line, famous for uniform high quality. Thus he can recommend on the basis of what's most profitable for you, not just what's most profitable for him. And he can keep you posted on all the newest practices of metalworking shops from coast to coast.

Make a mental run-down today of each abrasive operation your shop performs, then call in the man from CARBORUNDUM for his experienced, practical, unbiased counsel. You'll find him listed in the yellow pages under "Abrasives." Call him today—it's to your profit!

Here are only a few of the 30,000 reasons why you get the RIGHT combination of abrasive and method only from CARBORUNDUM

RUNDUM

MARK

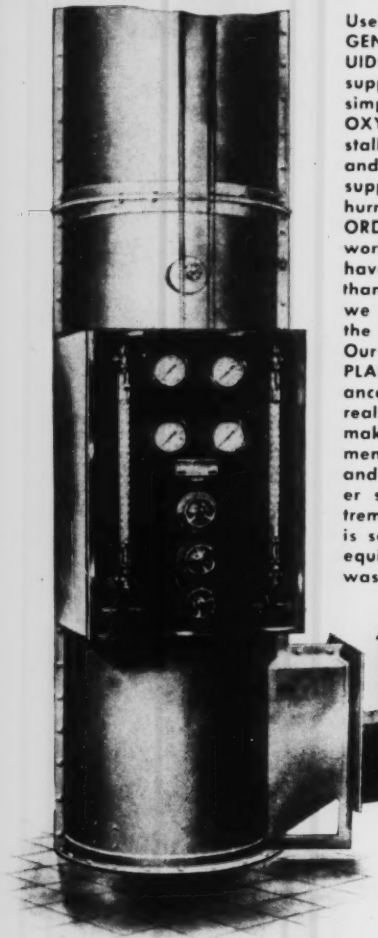
offers ALL abrasive products...to give you the proper ONE

SUPAIRCO

Oxygen

FROM AIR

MORE, QUICKER, For LESS



Users of large quantities of OXYGEN, NITROGEN GASES OR LIQUIDS should pay LESS for their supplies. THEY CAN DO IT, TOO, simply by installing a SUPAIRCO OXYGEN PLANT. This modern installation, featuring some new and practical improvements, will supply your oxygen needs in a hurry—and at ALMOST HALF THE ORDINARY COST. That is a fact worth a lot of consideration. We have been in business for more than 20 years, and the experience we have gained is reflected in the oxygen plants we produce. Our new SUPAIRCO OXYGEN PLANT is marked by its endurance, simplicity of operation, and really low maintenance. We make a size for every requirement; let us know your needs, and we will show you the proper size. The apparatus is extremely simple: in fact, the plant is so simple the only additional equipment is the compressor, washer and drier.

★ ★ ★ ★ ★

We're so eager about our own product we would like to tell you more about it. All inquiries answered promptly.

★

SUPERIOR AIR PRODUCTS CO.
128 MALVERN STREET • NEWARK 5, N. J., U. S. A.
Also Manufacturers of Plants and Apparatus for Liquid Air, Liquid Oxygen, Liquid Nitrogen and Containers and Flasks for Liquefied Gases.

naces could be added to national output with improved heat-up schedules after rebuilds.

New Press 'Touch Control'

DEVELOPMENT of a versatile hydraulic press control that gives instant ram action response is announced by Denison Engineering Co., Columbus, O. Known as "Touch Control," the servo-type valving in the oil hydraulic press circuit and excellent linkage with hand control gives it extremely close control over ram speed.

Depressing the hand lever raises the shipper rod. The motion is transmitted through the clevis and yoke to the valve spool. Spool rises, opens the valve pressure port and the ram descends, pulling the telescoping arm down at the same time. This tends to return the spool to its original closed position, stopping the ram and keeping it neutral until the control lever is moved again.

Operator Controls Force—In this manner the ram exerts just as much force as the operator's hand dictates. Pressure gage on the press tells him the exact force that will be necessary to perform a certain job.

Other reported advantages are fast ram approach, ability to inch the ram carefully and greater tool and fixture safety through high controlability.

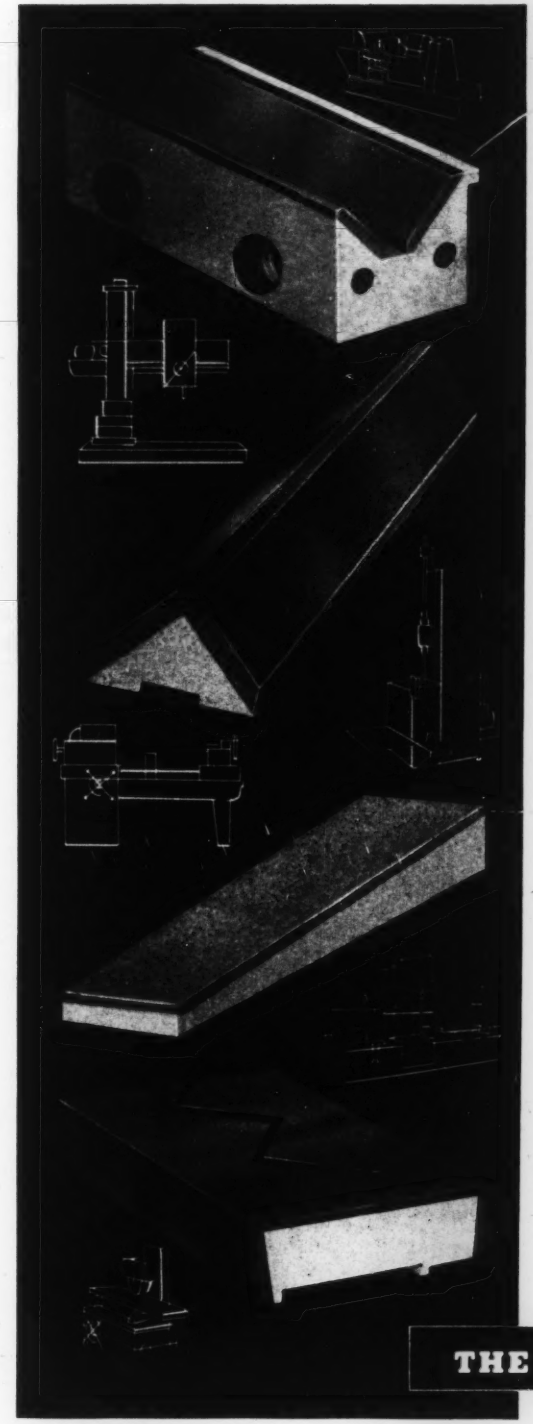
Cutting Tool Line Expanded

Supplementing its line of engineered cutting tools, Illinois Tool Works, Chicago, announces a new standard line. Included is a complete selection of standard end mills, saws, milling cutters, key slot cutters, hobs and shaper cutters.

The new line will be distributed under the trade name Illinite. In addition to the tools mentioned above, they will include gear measuring blocks, tool bits, die filing machines, and die files.

Instrument Meeting Nov. 17-18

Seventeen technical papers will be presented during a two-day American Institute of Electrical Engineers technical conference on recording and controlling instruments at the Benjamin Franklin



it's OK

let'em go with OK hardened ways, gibs, ball races, and Ampco bronze wear strips

The ultimate success and accurate life of your machine depends to a large extent on the accuracy, and uniform high hardness of its ways, gibs, ball races or wear strips. OK parts are the finest. They are made of special tool steel welded to a backing of soft tough steel under 2500 tons pressure, then hardened to a Rockwell C-65-66 and ground to tolerances of ± .00015 (both straight and parallel). They are available in all sizes and shapes, to meet your particular requirements.

OK wear strips are now available in welded Ampco bronze. Because of the OK's special bi-metal method of welding, less bronze is required. These ways are ground to close tolerances thus reducing manufacturing and assembly time.

Mail coupon below for comprehensive bulletins.

Manufacturers for the Metal Working Industry of Slitter Knives, Shear Blades, Rotary Shear Knives, Hardened Spacers, Hardened Ways, Gibs, Ball Races, Bronze Ways, and Wear Strips.

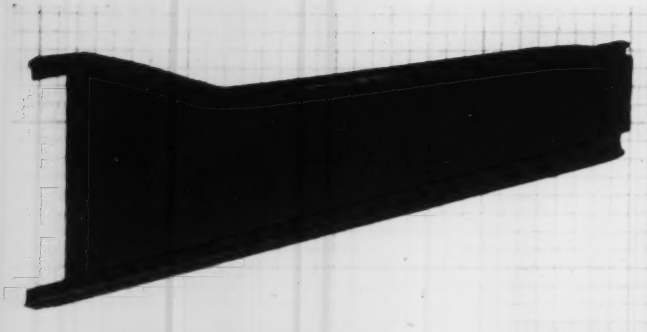
OHIO KNIFE CO., DEPT. C
Cincinnati 23, Ohio

Please send free Bulletins on OK ways, gibs, etc.

NAME_____
COMPANY_____
ADDRESS_____
CITY_____ STATE_____

THE OHIO KNIFE CO.

CINCINNATI 23, OHIO

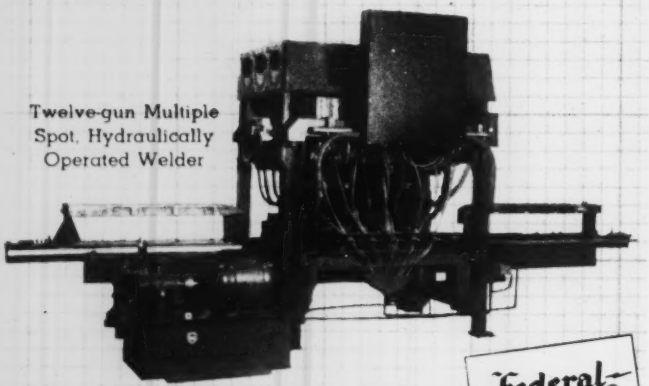


15,000 WELDS per HOUR

FEDERAL WELDER INCREASES PRODUCTION, CUTS COSTS ON NEW DESIGN AUTOMOTIVE FRAME CROSS MEMBER . .

It's happened again! A leading manufacturer has redesigned a product to receive the benefits of resistance welding. An automotive frame builder redesigned the cross members and asked Federal to build a machine that would weld the sections together.

Federal engineers designed and built two twelve-gun multiple spot, hydraulically operated welders that delivered 190 finished pieces per hour, doubling production and cutting costs by more than 25 percent. The welders are compact, releasing valuable floor space, with open framework that provides easy maintenance. The six 150 KVA transformers are arranged for three-phase distribution to equalize power demands. Equipped with shuttle type fixtures, the machines are constantly working . . . no down time while loading. These and many other features are reasons why this fabricator, like hundreds of others, has turned to resistance welding and Federal Welders for high speed, low cost and uniform quality production.



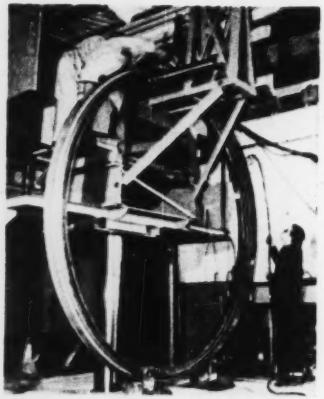
Twelve-gun Multiple Spot, Hydraulically Operated Welder

Federal® WELDERS

THE FEDERAL MACHINE & WELDER COMPANY

WARREN, OHIO

Warco® PRESSES



Expanding Expansion Joint

Some of the largest expansion joints ever made for a gas turbine power plant are seen being built by Solar Aircraft Co., San Diego. The 122-inch ID joints are used to accommodate thermal expansion in waste heat boilers and regenerators. They go to American Locomotive Co. and Lumas Co.

Hotel, Philadelphia, Nov. 17-18. Cooperating societies are the Instrument Society of America and American Society of Mechanical Engineers.

Control instruments will be studied in such fields as telephony, steam generation, steel and oil industries.

Metallizing Saves Pistons

Metallizing the wearing surface of compressor pistons saved a large chemical corporation the cost of replacement, according to officials of a West Virginia machine shop which did the job. The $1000-pistons were each put back into service at a cost of $250 and two days in the shop.

Rods are $5\frac{1}{4}$-inch alloy steel and wear $2\frac{1}{2}$ feet on either side of the centrally located pistons. They are first turned down approximately 0.100-inch on the radius, threaded with a fine U-type thread and then prepared with a surface roughing tool which produces a surface similar to knurling.

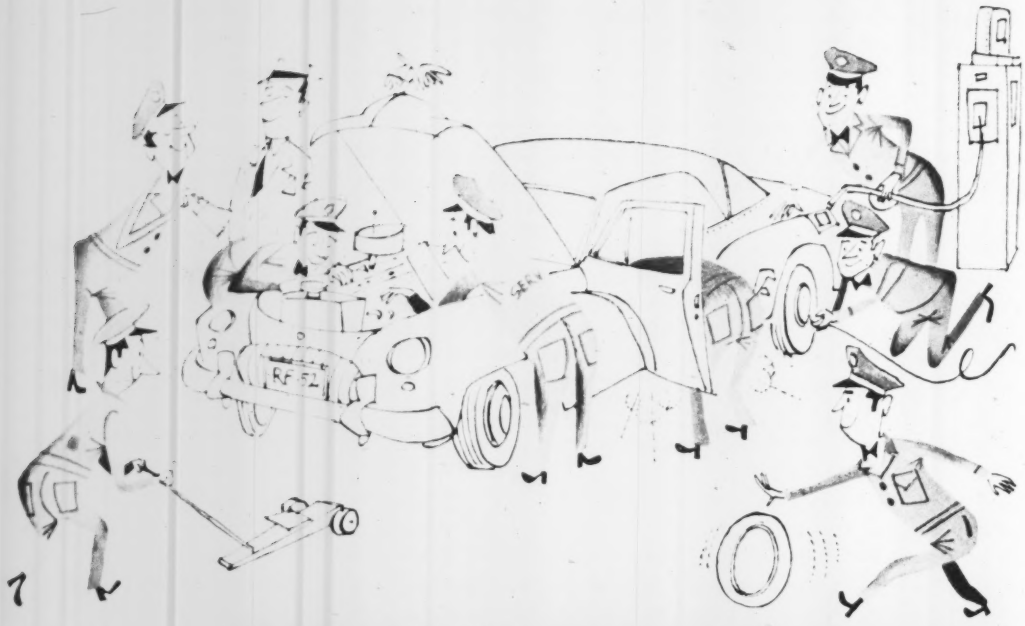
This surface is sprayed with a special stainless alloy to about $\frac{3}{32}$-inch over the original diameter, and the rod is ground to required dimension.

There's gold for you in "them thar" Coils!

SuVeneer® CLAD METALS

Prospecting for more profitable product fabrication? You're in luck when you find how **SuVeneer** Clad Metals pan-out on your applications . . . in savings of expensive non-ferrous materials, in ease of fabrication, and in improved product performance. **SuVeneer** Clad Metals are composites of genuine copper, or brass, or nickel, bonded inseparably to plain strip steel on one or both sides. ● You save from 70% to 80% of the solid strategic metals, while enjoying *all* their surface advantages. Write!

Superior Steel
CORPORATION
CARNEGIE, PENNSYLVANIA



over-all service...

The responsibility of the Torrington engineer does not end with a recommendation for a particular type of anti-friction bearing. He makes every effort to "follow through" to see that the bearing continues to give the best possible performance, with a minimum of maintenance.

Over-all service—starting with the original design and continuing through in-service operation—has helped to produce the *lasting* solution to the friction problems of many manufacturers. Why not discuss *your* application with a Torrington engineer today?

THE TORRINGTON COMPANY

South Bend 21, Ind. Torrington, Conn.

District Offices and Distributors in Principal Cities of the United States and Canada

TORRINGTON BEARINGS

Spherical Roller • Tapered Roller • Straight Roller • Needle • Ball • Needle Rollers

CALENDAR
OF MEETINGS

November 5-7, Industrial Management Society: Annual time and motion study and management clinic. Hotel Sheraton, Chicago. Society address: 35 E. Wacker Drive, Chicago 1.

November 6-9, Scientific Apparatus Makers Association: Mid-year meeting; industrial instrument, laboratory equipment, optical, aeronautical and military instrument sections. The Homestead, Hot Springs, Va. Association address: 20 N. Wacker Drive, Chicago 6. Secretary: Kenneth Anderson.

November 6-7, Society of Automotive Engineers: National fuels and lubricants meeting. The Mayo, Tulsa, Okla. Society address: 29 W. 39th St., New York 18. Secretary: John A. C. Warner.

November 8, American Society of Tool Engineers, Chicago Chapter: Annual midwestern tool engineering conference, Urbana, Ill. Conference arrangements: Prof. L. E. Doyle, University of Illinois.

November 8-9, Open Steel Flooring Institute Inc.: Fall meeting. The Greenbrier, White Sulphur Springs, W. Va. Institute address: 2311 First National Bank Bldg., Pittsburgh 22. Secretary: Stuart J. Swensson.

November 9-11, Grinding Wheel Institute: Annual meeting. Hotel Claridge, Atlantic City. Institute address: 2130 Keith Bldg., Cleveland 15. Manager: F. A. Peterson.

November 9-11, Abrasive Grain Association: Annual meeting. Hotel Claridge, Atlantic City. Institute address: 2130 Keith Bldg., Cleveland 15. Manager: F. A. Peterson.

November 10-11, The Magnesium Association: Annual meeting and exhibit. Hotel Biltmore, New York. Association address: 122 E. 42nd St., New York 17. Assistant secretary: (Miss) Martha I. Hansen.

November 10-13, The Wire Association: Annual meeting. Hotel Carter, Cleveland. Association address: 453 Main St., Stamford, Conn. Executive secretary: Richard E. Brown.

November 10-13, American Petroleum Institute: Annual meeting. Conrad Hilton Hotel and Palmer House, Chicago. Institute address: 50 W. 50th St., New York 20.

November 10-14, National Electrical Manufacturers Association: Annual meeting. Haddon Hall, Atlantic City, N. J. Association address: 155 E. 44th St., New York 17. Secretary: W. J. Donald.

November 14, American Iron & Steel Institute: Regional technical meeting. Hotel Mark Hopkins, San Francisco. Institute address: 350 Fifth Ave., New York 1. Meeting director: Frank Ragland.

November 18-20, Conference, High Energy Nuclear Physics: National Science Foundation and University of Rochester, sponsors, Rochester, N. Y.

November 19, American Standards Association: Annual meeting. Waldorf-Astoria Hotel, New York. Association address: 70 E. 45th St., New York 17. Secretary: G. F. Hussey Jr.

November 19-20, Industrial Hygiene Foundation: Annual meeting and conference. Foundation address: Mellon Institute, Pittsburgh 13. Managing director: C. Richard Walmer, M. D.

November 20-21, American Society for Personnel Administration: Fall meeting & exhibit. Hotel Schroeder, Milwaukee. Society address: 2917 E. 79th St., Cleveland. Secretary: Mary E. Hopkins.

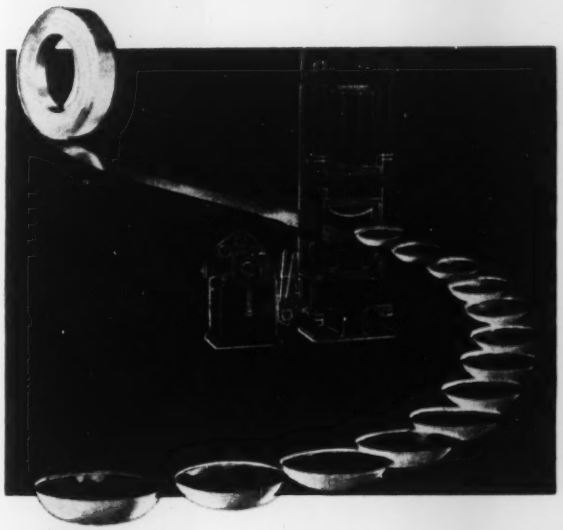
November 20-21, American Society for Quality Control: Midwest quality control conference. Hotel Claypool, Indianapolis. Conference information: Dale A. Cue, Indianapolis Section, ASQC, Box 5664, Indianapolis.

November 20-22, Galvanizers Committee, American Zinc Institute: Fall meeting. Hotel Bismarck, Chicago. Institute address: 60 E. 42nd St., New York 17. Secretary-treasurer: E. V. Gent.

November 21, Association of American Railroads: Annual meeting. Waldorf-Astoria Hotel, New York. Association address: Transportation Bldg., Washington 6. Secretary-Treasurer: G. M. Campbell.

November 30-December 5, American Society of Mechanical Engineers: Annual meeting. Statler and McAlpin Hotels, New York.

FOR A FINE FINISH ON YOUR QUALITY PRODUCTS *USE* FOLLANSBEE COLD ROLLED STRIP



For fabricating your quality products with a fine finish—use Follansbee Cold Rolled Strip.

Follansbee Cold Rolled Strip is rolled, tempered and supplied to your specifications—a custom-made, quality strip that fulfills most manufacturing needs.

Follansbee custom-quality Cold Rolled Strip can be delivered from the mill directly to you providing a continuous supply of uniform steel from coils to your automatics, regardless of forming operations involved. For flat stamping to deep drawings, Follansbee Cold Rolled Strip is the answer to your production problems.

Consult your trained Follansbee Steel representative. He will be glad to discuss your fabricating problems with you.

FOLLANSBEE STEEL CORPORATION

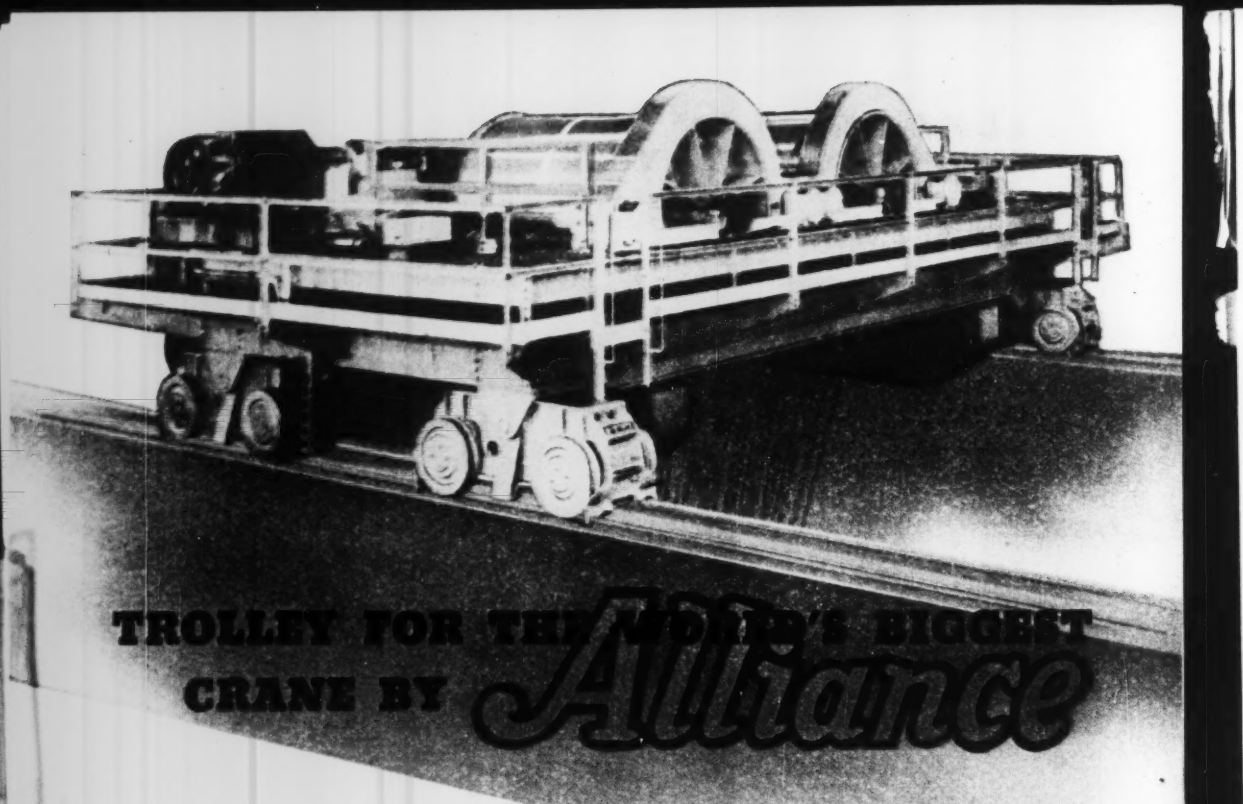
GENERAL OFFICES, PITTSBURGH 30, PA.

POLISHED BLUE SHEETS AND COILS SEAMLESS TERNE ROLL ROOFING COLD ROLLED STRIP

Sales Offices—New York, Philadelphia, Rochester, Cleveland, Detroit, Milwaukee. *Sales Agents*—Chicago, Indianapolis, Kansas City, Nashville, Los Angeles, San Francisco, Seattle; Toronto and Montreal, Canada. *Mills*—Follansbee, W. Va.

FOLLANSBEE METAL WAREHOUSES

Pittsburgh, Pa. Rochester, N.Y. Fairfield, Conn.



TROLLEY FOR THE WORLD'S BIGGEST CRANE BY Alliance

Paul Bunyan used to brag about threading a needle with his enormous hands . . . but he has little in Alliance trolleys. Swiftly, but with the accuracy and control of a micrometer, the world's largest crane moves tons of molten steel with utmost safety.

The trolley is equipped with 16 double-flange track wheels which operate on rails at 30" centers. These wheels are compensated for longitudinal and transverse equalization which assures equal loading of all wheels. The rails being located over the web plates prevent flexing and cracking of top cover plate and reduces the number of diaphragms required.

This ladle crane trolley is equipped with a two-motor, synchronized worm drive interlocked double-drum type main hoist. The synchronizing shaft employed in this scheme of gearing not only eliminates the undesirable ratchet gears but makes possible an additional safety feature in case one of the hoist motors fail. Under this condition both worms are driven by the remaining motor and all gearing functions as with two motors. In case of failure of one hoist motor on the conventional drive without the synchronizing shaft, hoisting is accomplished by only one set of gears. This imposes a double load on active gearing, the second drum being driven through the interlocking drum gears. The hoist gearing is so proportioned on all ladle cranes that the full capacity of the crane can be lifted by one motor without exceeding the quarter hour rating.

The drum gears and pinions of the main hoist of this new crane have precision-cut, single-helical teeth, and in cooperation with the worm drive, assure vibrationless operation on either high or low speed hoisting and lowering.

All gears are fully enclosed and operate in a bath of oil, assuring long life and low maintenance.

This trolley is designed for maximum accessibility and ease of maintenance. Anti-friction bearings throughout.

The 4-part safety rope system installed on this crane affords the highest degree of safety in rope reeving.

Contact Alliance today. At your convenience a qualified engineer will discuss your heavy material handling problems. It's to your advantage.

THE

Alliance

MACHINE COMPANY

World's largest builders of world's largest cranes

MAIN OFFICE
ALLIANCE, OHIO
PITTSBURGH OFFICE
1622 OLIVER BUILDING · PITTSBURGH, PA.

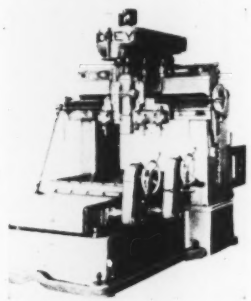
NEW PRODUCTS and equipment

Reply cards on page 165 will bring you more information on any new products and equipment in this issue

Heavy-Duty Profiler

. . . designed for large castings

Machine is specifically designed for milling and profiling large forgings and castings, such as aluminum and magnesium air frames, as well as cast iron parts and steel forgings. Model 40M combines rigid construction with maximum



power to take advantage of tungsten carbide tools. It has two-speed 15-hp motor and operates through a backgeared drive to provide spindle speeds 125 to 4600 rpm.

Crosshead is mounted in balance on a vibration-damped cross rail. Model can be supplied in any table length up to 10 feet. Copying attachments are available for all movements. Morey Machinery Co. Inc., Dept. ST, 410 Broome St., New York 13, N. Y.

USE REPLY CARD—CIRCLE No. 1

High-Capacity Steam Cleaner

. . . discharges 540 gph detergent

Cleaning machine is capable of discharging a maximum 540 gallons per hour pressure detergent spray and a like amount of hot or cold pressure rinse simultaneously. Model BOE-600S cleaner is equipped with a 60-gallon detergent concentrate tank and 40-gallon fuel tank. It will operate for 4 hours continuously at maximum load.

Vapor generator operates with

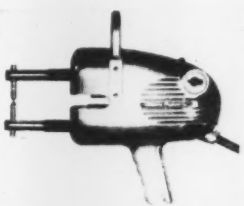
thermal efficiency in excess of 80 per cent under all operating loads. Detergent metering device maintains detergent-water ratio at level found most effective. Clayton Mfg. Co., Dept. ST, El Monte, Calif.

USE REPLY CARD—CIRCLE No. 2

Portable Spot Welder

. . . has electronic timing control

This portable spot welder is made with electronic timing control that enables operator to establish a definite predetermined weld-



ing period. Standard models have 7-inch throat, 3-inch opening. With adapters, additional lengths up to 18 inches are available.

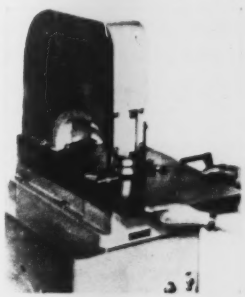
Unit welds metals with 3 16-inch combined thickness. Available optionally is a stand that can make the welder a floor model, foot operated and suitable for semi-production work. Timing control reaches from 1/60 to 1 second. Ampower Products Co., Dept. ST, 5737 W. 87 St., Oak Lawn, Ill.

USE REPLY CARD—CIRCLE No. 3

Power-Operated Punch Presses

. . . rate: 180 strokes per minute

Two punch presses, both power-operated with rated capacity of 5 tons, will punch a 4-inch diameter hole in 16-gage sheet steel or a $\frac{3}{8}$-inch hole in 3 16-inch plate. Production rate reaches 180



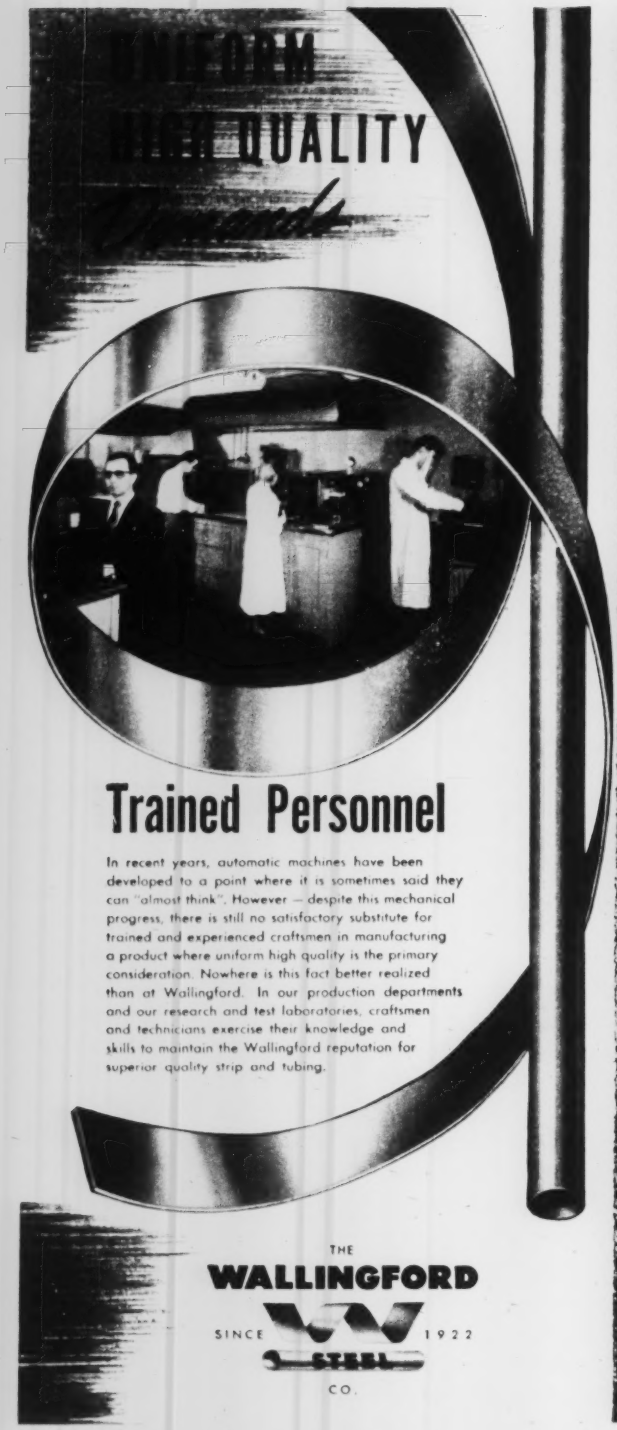
strokes per minute as foot control frees both the operator's hands. O'Neil-Irwin Mfg. Co., Dept. ST, 619 Eighth Ave., Lake City, Minn.

USE REPLY CARD—CIRCLE No. 4

Wire Cup Brush

. . . removes rust, scale

A wire cup brush has been developed for removal of rust, scale, paint and welding slag from tanks, gears and other metal surfaces. It consists of inner and outer metal adapters with replaceable cup-


UNIFORM
HIGH QUALITY
Trained Personnel
In recent years, automatic machines have been developed to a point where it is sometimes said they can "almost think". However — despite this mechanical progress, there is still no satisfactory substitute for trained and experienced craftsmen in manufacturing a product where uniform high quality is the primary consideration. Nowhere is this fact better realized than at Wallingford. In our production departments and our research and test laboratories, craftsmen and technicians exercise their knowledge and skills to maintain the Wallingford reputation for superior quality strip and tubing.
THE
WALLINGFORD
SINCE 1922
STEEL
CO.
LOW CARBON • HIGH CARBON • ALLOY • STAINLESS • STRIP AND TUBING

NEW PRODUCTS and equipment

shaped filler in which wire bristles are anchored in place with rubber. Brush is available in wire gages ranging from 0.014 to 0.028-inch. Hewitt-Robins Inc., Dept. ST, 666 Glenbrook Rd., Stamford, Conn.

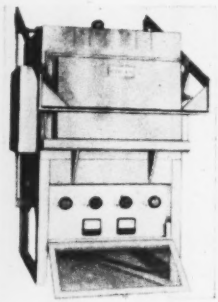
USE REPLY CARD—CIRCLE No. 5

Heat-Treating Furnaces

. . . harden high-speed tool steel

Three models in a line of electric high-speed tool steel hardening furnaces cover an operating temperature range of 1650 to 2500° F. These chamber sizes are available: 6¼ x 4 x 9 inches; 12 x 8 x 18 inches; and 12 x 8 x 24 inches.

Multi-tap transformers, arranged for select voltages to be applied



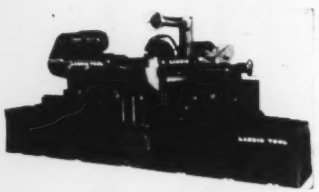
to Globar heat elements, exercise power control. Cooley Electric Mfg. Corp., Dept. ST, 38 S. Shelby St., Indianapolis 7, Ind.

USE REPLY CARD—CIRCLE No. 6

Large Diameter Grinder

. . . maximum swing: 48 inches

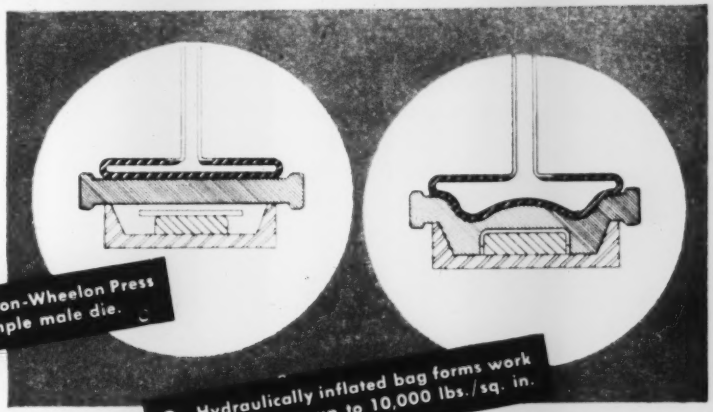
Plain grinder for large diameter workpieces, the model CHW, is available in 30, 36 and 48-inch di-



ameter swings. Lengths between centers are 48, 72, 96 and 120 inches. A 10 or 15 hp motor is employed to drive the 30-inch di-

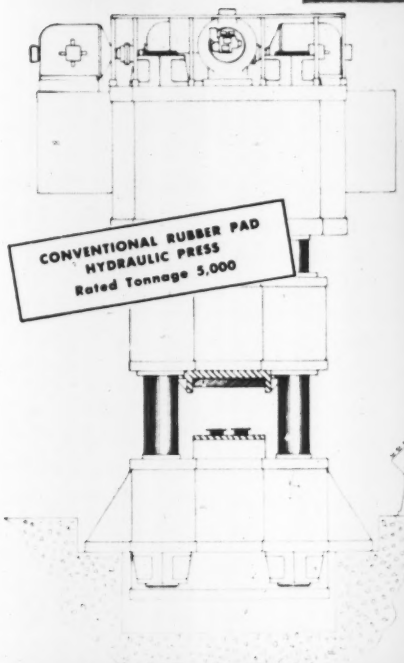
LOOK AT THIS *NEW METHOD* OF RUBBER PAD FORMING!

- Completely Revolutionary
- Costs Less
- Eliminates Hand Work
- Simple Male Die Only
- No Set-up Time



1. Blank inserted in Verson-Wheelon Press over inexpensive, simple male die.

2. Hydraulically inflated bag forms work at pressures up to 10,000 lbs./sq. in.

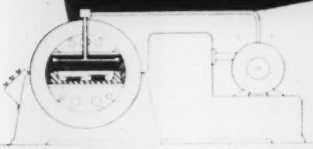


CONVENTIONAL RUBBER PAD HYDRAULIC PRESS
Rated Tonnage 5,000

DONE BY THIS LITTLE VERSON-WHEELON PRESS

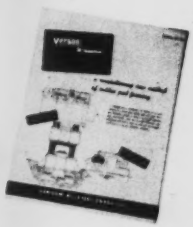
Rated Tonnage 10,800

With this little press, heavy gauge metal is completely formed—it will even make perfect return flanges! Compare it with the big, expensive conventional rubber pad forming press at the left which seldom turns out pieces not requiring further hand forming.



GET THIS BULLETIN!

. . . Complete information of the Verson-Wheelon Press and the revolutionary new rubber pad forming process. Ask for Bulletin VW-52.



Originators and Pioneers of Allsteel Stamping Press Construction

VERSON ALLSTEEL PRESS COMPANY

9318 South Kenwood Avenue, Chicago 19, Illinois — So. Lamar at Ledbetter Dr., Dallas Texas

A VERSON PRESS FOR EVERY JOB FROM 60 TONS UP

MECHANICAL AND HYDRAULIC PRESSES AND PRESS BRAKES • TRANSMAT PRESSES • TOOLING

Threaded Specialties
to Class 3 Fit

For years Pawtucket has specialized in specialties — of any size, in any metal, to any specifications.

Two items have become widely used because of their lower cost, more accurate fit and greater-than-needed strength. Pawtucket's eye bolts and tee-head bolts are made by an exclusive process that guarantees all these advantages.

For these and any other threaded specialties, save by seeing Pawtucket — "The Bolt Man".

BETTER BOLTS SINCE 1882

"THE BOLT MAN"

T.M. REG.

PAWTUCKET
MANUFACTURING COMPANY
327 Pine Street · Pawtucket, R. I.
THE PLACE TO SOLVE YOUR BOLT PROBLEMS

NEW PRODUCTS and equipment

ameter grinding wheel.

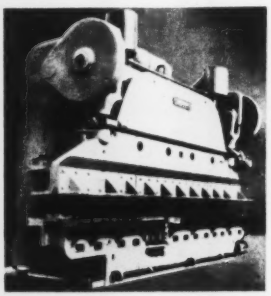
Double-type slide under the wheelhead is positioned manually, but can be supplied with power operation. Hydraulic table traverse is adjustable to any speed between 3 and 130 ipm. Wheel spindle runs in Microsphere bearings. Landis Tool Co., Dept. ST, Waynesboro, Pa.

USE REPLY CARD—CIRCLE No. 7

Special Purpose Press Brake

. . . used for shallow draw work

All-Steel press brake can be used for shallow draw work as well as conventional press brake work. Double plate bed is 30-inches wide, 15 feet-8 inches long. Fourteen 6-



inch air cylinders are mounted between plates for operating draw rings, knockout bars and similar units.

Machine weighs 72,000 pounds, has a speed of 23 strokes per minute and removable ram angles for press or brake operation. Additional features include air counterbalances and horns on each end of the bed and ram. Cincinnati Shaper Co., Dept. ST, Hopple, Garrard & Elam Sts., Cincinnati 25, O.

USE REPLY CARD—CIRCLE No. 8

Ring Type Rheostats

. . . close control, no backlash

A contact arm and drive shaft assembly that provide smooth, close control with no backlash are features of the 25 and 50 w Vitrohm ring type

"SO THAT'S WHERE THOSE LITTLE PIGS WENT!"
CHIEF KEOKUK: Sure enough, dear! Thousands of Electro-Silvery pigs were melted down to help make the iron and steel for those skyscrapers . . .
PRINCESS WENATCHEE: . . . and wasn't Electro-Silvery used in making the metal for this boat we're on, and for tanks and tractors and automobiles?
CHIEF KEOKUK: Right! It's hard to find *any* type of product made of iron or steel that *doesn't* use Electro-Silvery!
CHIEF KEOKUK JR.: Gosh, Pop, what *is* Electro-Silvery?
CHIEF KEOKUK: Electro-Silvery, son, is a form of ferro-silicon that acts as a vital control element in the production of iron and steel . . .
PRINCESS WENATCHEE: . . . and the world's largest producer of this vital ingredient is the Keokuk Electro-Metals Company!
KEOKUK
ELECTRO-METALS COMPANY
KEOKUK, IOWA
WENATCHEE DIVISION: WENATCHEE, WASHINGTON
Keokuk Electro-Silvery is used by foundries and steel plants in the form of these three pigs, weighing 60 pounds . . . 30 pounds . . . and 12½ pounds.
SALES AGENTS: MILLER AND COMPANY
332 S. Michigan Ave., Chicago 4, Illinois
3504 Carew Tower, Cincinnati 2, Ohio
915 Olive St., St. Louis 1, Missouri
dick stone

for economy in coiling,
knotting, forming —

use **Pittsburgh**

Oil Tempered SPRING WIRE

Day after day, in plant after plant Pittsburgh Oil Tempered Spring Wire is proving that it has the acceptance of production managers and machine operators alike. They find it has the uniform size accuracy and ductility to work smoothly in coiling, knotting, and forming machines. This reduces time; keeps production records climbing. That is why it pays to specify Pittsburgh Oil Tempered Spring Wire. It has the quality, proved in use that gives you economical production runs. For information write Department S, Grant Building, Pittsburgh 30, Pa.

Pittsburgh Wire

A product of **PITTSBURGH STEEL COMPANY**

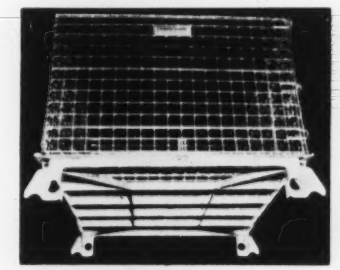
rheostats. The balanced spring steel contact arm maintains uniform contact pressure and is interlocked directly to a Mycalex insulating hub molded to the drive shaft. Ward Leonard Electric Co., Dept. ST, Mt. Vernon, N. Y.

USE REPLY CARD—CIRCLE No. 9

Storage, Assembly Container

. . . takes 5200-pound loads

Container for storage, shipment or assembly line operation, the Clearview model Cargotainer, is built without center legs to permit use of any type of moving equipment. By folding, five of the



containers occupy the same space as one unfolded. The unit takes 5200-pound fluid loads; capacity is increased under static loads. Special corner plates are used to resist shock. Pittsburgh Steel Products Co., subsidiary of Pittsburgh Steel Co., Dept. ST, Pittsburgh 30, Pa.

USE REPLY CARD—CIRCLE No. 10

Cut Thread Studs

. . . additional sizes made

Additional sizes of cut thread studs are available. Sizes range from 2 to 20 inches long in 5/16-18, $\frac{3}{8}$-16, $\frac{1}{2}$-13, $\frac{5}{8}$-11, $\frac{3}{4}$-10, $\frac{7}{8}$-9 and 1 inch-8. Northwestern Tool & Engineering Co., Dept. ST, Dayton 3, O.

USE REPLY CARD—CIRCLE No. 11

Redesigned Plating Barrel

. . . has three-point suspension

Plating barrel is redesigned to employ three hanger studs instead of four. Improved barrel design has two studs at the drive end, one

Production Rhythm for the Grinding Department

SIMONDS ABRASIVE CO.

Grinding Wheels

Keep your production line humming. Get in tune for maximum output with Simonds Abrasive Co. grinding wheels.

You will find plenty of satisfaction, savings and serviceability in these accurately specified production tools. Right now they're proving their adaptability, efficiency and economy in every phase of industrial grinding from production snagging to micro-inch finishing. Complete line includes grinding wheels, mounted wheels and points, segments and abrasive grain.

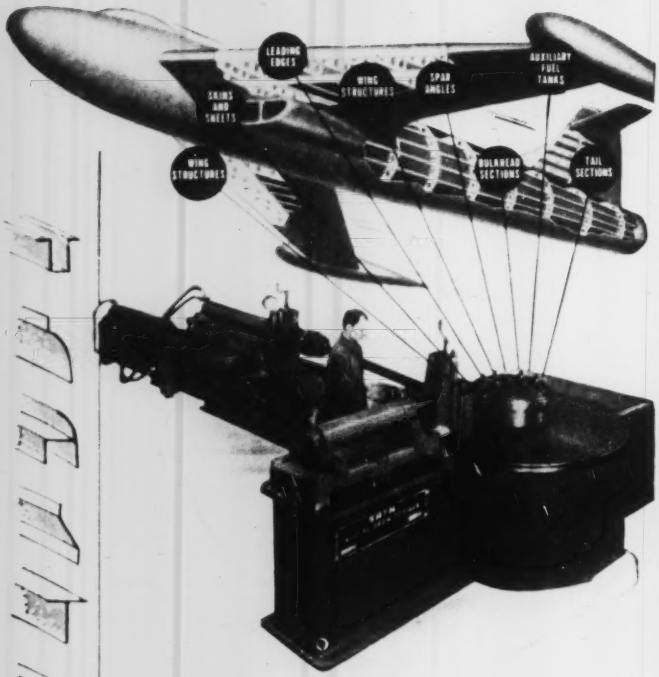
Write for free data book and name of your Simonds distributor.

SIMONDS ABRASIVE CO. PHILADELPHIA 37, PA. BRANCH WAREHOUSES: CHICAGO, DETROIT, BOSTON
DISTRIBUTORS IN PRINCIPAL CITIES

Division of Simonds Saw and Steel Co., Fitchburg, Mass. Other Simonds Companies: Simonds Steel Mills, Lockport, N. Y., Simonds Canada Saw Co., Ltd., Montreal, Que. and Simonds Canada Abrasive Co., Ltd., Arvida, Que.

LEADING AIRCRAFT MANUFACTURERS ARE BUYING

BATH RADIAL DRAW CONTOUR FORMERS



AIRCRAFT FUSELAGE AND JET ENGINE COMPONENTS IN PRODUCTION QUANTITIES ... FAST AND ACCURATE!

The versatility of the Bath Radial Draw Contour Former makes it a natural for forming aircraft fuselage, jet engine and guided missile parts. Stretch and compression formed, the parts pass rigid inspection. Cross sections of roll-formed and extruded parts as shown at left, are faithfully maintained throughout varied bends.

The performance range extends from shallow bends in formed strip stock and sharp bends in flanged extrusions to full circles and spirals in metals from 24ST aluminum to titanium of 95% purity.

Machine capacities from 12½ to 200 tons in standard Models. Write for catalog CF-352.

THE CYRIL BATH COMPANY

Manufacturers of Metal Forming Machinery

6972 MACHINERY AVENUE • CLEVELAND 3, OHIO

NEW PRODUCTS and equipment

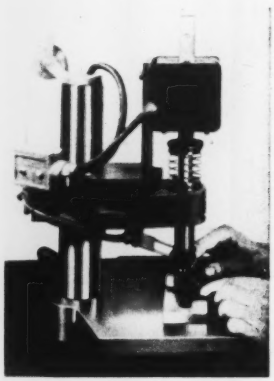
at the other end. This three-point suspension is said to prevent rocking that ordinarily occurs when plating barrels have studs included in even numbers at each end. Belke Mfg. Co., Dept. ST, 947 N. Cicero Ave., Chicago 51, Ill.

USE REPLY CARD—CIRCLE No. 12

Electric Staking Machine

. . . employs power by solenoid

This electric staking machine is powered by a solenoid instead of the spring-loaded trip hammer used on many conventional stakers. Result is rapid operation, said to reduce operator fatigue and make possible a 25 to 50 per cent production increase. Another advantage is complete working safety for the operator. Both holddown pressure and staking blow are fully adjustable.



Largest model Electrostake delivers maximum 3000-pound impact. Tool weighs 45 pounds and is completely portable. Black & Webster Inc., Dept. ST, 445 Watertown St., Newton 58, Mass.

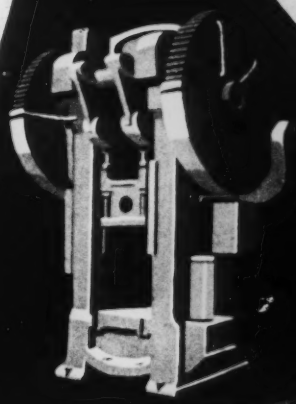
USE REPLY CARD—CIRCLE No. 13

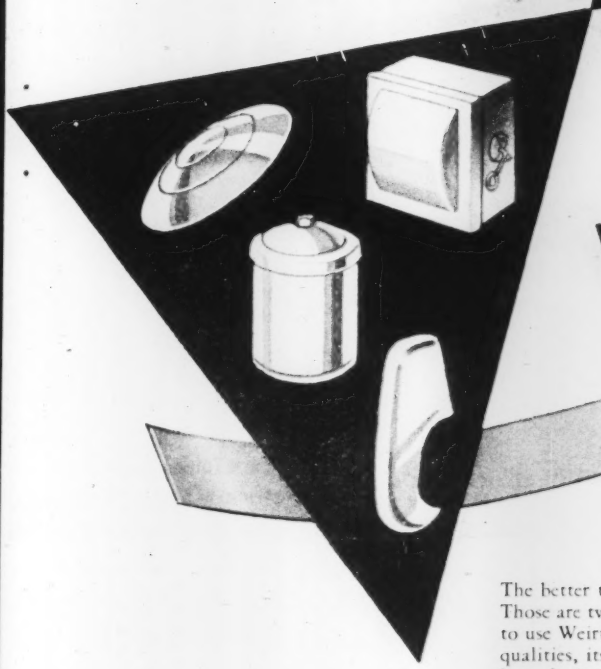
Metal Nameplates

. . . mounted easily, quickly

Autographs are lithographed in one or two colors on 0.010 chrome steel or 0.016 chrome aluminum and are designed for use by manufacturers in identifying the products they sell or service. Serially numbered Autographs are used in conjunction with inventory con-

for better output-





WEIRTON
STRIP STEEL

The better the strip, the better the product—and the easier production. Those are two important reasons why manufacturers find it advantageous to use Weirton cold-rolled strip steel. Its excellent drawing and forming qualities, its constant uniformity, promote plant efficiency and economy by reducing spoilage and tool expense. In short—Weirton strip boosts both quantity and quality.

WEIRTON STEEL COMPANY
WEIRTON, WEST VIRGINIA

NATIONAL STEEL CORPORATION

Electro
TRADE MARK
SINCE 1919

Specific Purpose Grinding Wheels

General purpose grinding wheels are efficient *enough* and economical *enough* for many operations; and we make a lot of them that win out time and again in competitive tests. But our specialty is Specific Purpose Grinding Wheels for highly specialized operations under wholly individual conditions. May we, entirely upon our responsibility, send a Field Sales Engineer to see whether you could gain by using them?

Electro Refractories & Abrasives Corporation
344 Delaware Avenue, Buffalo 2, N. Y.
Regional Warehouse: Los Angeles 58, California
Plants: Buffalo, N. Y. and Cap-de-la-Madeleine, P. Q., Canada

NEW PRODUCTS and equipment

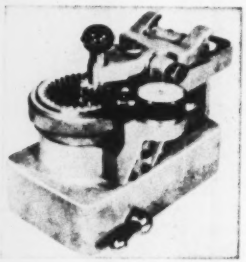
trol systems. Numbergraphs serve the same purpose as the serially numbered Autographs, but consist of serial numbers only stamped into 0.008 mill finish aluminum. All plates have resilient, solvent reactivated backing. Metalcraft Inc., Dept. ST, Mason City, Iowa

USE REPLY CARD—CIRCLE No. 14

Gear-Rolling Fixtures

. . . check size, eccentricity

Internal gear-rolling fixtures check size, eccentricity, roll smoothness and face runout. Fixtures are available in three sizes: Model 702-A for gears up to 4



inches OD; 702-B, gears to 7 inches OD; and 702-C, gears to 12 inches OD.

Size, eccentricity and roll smoothness are indicated by an 0.0005-inch indicator. Another similar indicator shows face runout of the gear simultaneously. Control lever ejects the gear from the chuck. Michigan Tool Co., Dept. ST, 7171 E. McNichols Rd., Detroit 12, Mich.

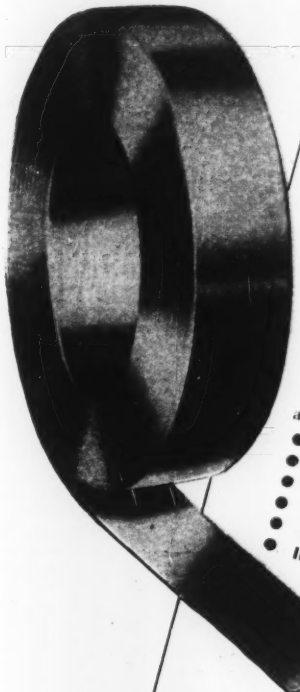
USE REPLY CARD—CIRCLE No. 15

Swivel Caster Turn Tables

. . . simplify moving and turning

A complete series of swivel caster turntables includes types for light, medium and heavy-duty service. The casters permit moving and turning material for such purposes as transfer between conveyors or machines, fabrication, assembly, packing and marking. Width of the caster wheels carries the load, avoiding the single point support encountered with caster balls.

To protect finished surfaces, caster wheels can be made of neo-



When spring steel must suit your job to a . . . .

Check with Sandvik

When your application demands a spring steel that is practically custom-fitted to specific physical requirements, call SANDVIK.

From long experience with the demands of a wide variety of spring steel applications SANDVIK has developed specialized steels to meet specific types of severe service. By composition and processing, SANDVIK assures *high fatigue life, fine surface finish* and *accurate and uniform gauge.*

SANDVIK cold-rolled, high carbon or alloyed strip steels are supplied:

- **In special analyses for specific applications**
- **Annealed, unannealed or hardened and tempered**
- **Precision-rolled in thicknesses from .001"**
- **With bright finish or blue or yellow polished**
- **With round edges or square edges**
- **In a wide range of widths**

Phone or write for complete information, technical advice or current stock lists.

55-34

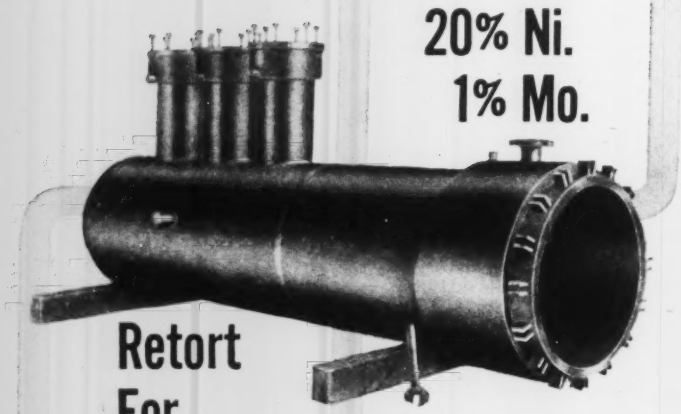
SOME SANDVIK SPECIALTY SPRING STEELS

Band Saw Steels • Camera Shutter Steel
Clock and Watch Spring Steels • Compressor Valve Steel • Doctor Blade Steel
Feeler Gauge Steel • Flapper Valve Steel
Knife Steels • Razor Blade Steel • Reed Steel • Shock Absorber Steel • Sinker Steel • Spring Steels • Textile Steels
Vibrator Reed Steel

SANDVIK STEEL, INC.
111 EIGHTH AVE., NEW YORK 11, N. Y., WAtkins 9-7180
SANDVIK CANADIAN LTD.,
P. O. BOX 40, STATION O, MONTREAL 9, P. Q.

DURASPUN

30% Cr.
20% Ni.
1% Mo.



Retort
For
Defense
Project

Perhaps the most interesting feature of this Duraspun High Alloy Casting is that four different sizes of centrifugal castings are involved. These vary from 34" to 3½" in diameter. Sections, outlets, collar bands, lugs etc., were all welded together in our shop to form the retort as you see it in the picture. Assembled weight runs around 7,464 pounds.

High alloy castings is our business—not merely the adjunct of an extensive steel founding business. We have the experience — 30 years in the static casting division and 20 years on centrifugal castings. We pioneered both kinds for castings in this country. And we have excellent testing and checking facilities, including a 400,000 volt X-ray machine and gamma-ray units.

If you would like this combination of wide experience, modern shop practice, up-to-date equipment and full testing facilities working on your next high alloy casting, bring it to us.

THE DURALOY COMPANY

Office and Plant Scottdale, Pa · Eastern Office 12 East 41st Street, New York 17, N.Y.

Detroit Office 23906 Woodward Avenue · Pleasant Ridge, Mich

Atlanta J. M. TULL Metal & Supply Co · Chicago F. O. NELSON 332 S. Michigan Avenue · San Francisco JOHN D. FENSTERMACHER 1241 Taylor Street

METAL GOODS CORP Dallas • Denver • Houston • Kansas City • New Orleans • St. Louis • Tulsa

NEW PRODUCTS and equipment

prene or other synthetic material; for other applications, they can be made of semisteel. Wheels for light and medium-duty tables have oil-less bearings; for heavy duty tables, wheels have hardened and ground steel bushings, Alemite lubricated. Samuel Olson Mfg. Co. Inc., Dept. ST, 2423-25 Bloomingdale Ave., Chicago 47, Ill.

USE REPLY CARD—CIRCLE No. 16

Motorized Industrial Sweeper

. . . cleaning area: 48 inches

Rotary brush sweeper and heavy-duty vacuum cleaner are integrated to clean plant dust, dirt and debris efficiently. Sweeping is done by eight 36-inch hardwood,

Palmyra-filled brushes welded into a single circular unit 17 inches diameter and 36 inches long. Effective sweeping area is increased to 48 inches by application of side brush attachment.

Vacuum is built-in, mounted directly on the engine shaft. Multi-Clean Products Inc., Dept. ST, 2277 Ford Parkway, St. Paul 1, Minn.

USE REPLY CARD—CIRCLE No. 17

Optically Precise Gage

. . . inspects drill points

Drill Point-Chek, an optically precise gage, inspects drill points in a matter of seconds. New drills and resharpened drills can be inspected to make certain drill lips have been ground to equal angles and equal lengths. Any included angle of point, up to 145 degrees, may be measured and any two lip

Isn't it time your business enjoyed these savings, too?

▲ ▲ ▲ In the printing industry
YALE Gas Trucks cut costs... save time and man hours by speedily lifting, moving and stacking tons of heavy paper... in and out of storage areas; to and from giant presses... in and out of receiving and delivery facilities. Fill out coupon below to learn how *your* industry can achieve similar savings.
YALE

Savings of up to 75%...

...in materials handling costs are important savings for *any* industry! And, *any* industry can realize these savings by using YALE Gas Trucks. You save, too, on maintenance... because YALE Gas Trucks are built to stand up under the hardest 'round-the-clock service.

Get the full story of YALE's cost-cutting advantages and how they apply to your business. Contact your YALE representative... he is fully qualified to recommend and demonstrate the equipment that will do the best job for you... most efficiently... at lowest cost.

You get these exclusive features when you buy YALE Gas Trucks:

FLUID DRIVE
3 to 8 times longer clutch life

HYPOID GEARS
30% more strength against shock loads

SHOCKLESS STEERING
passenger-car steering ease

AUTOMOTIVE-TYPE BRAKES
smoother, safer stops

ROLLER CARRIER UPRIGHTS
less friction and more efficiency

65-HP ENGINE
waterproofed and built for rugged, constant service

No other Gas Trucks offer all these money-saving advantages!

YALE is a registered trade mark of The Yale & Towne Mfg. Co.

MAIL THIS COUPON TODAY

The YALE & TOWNE Mfg. Co., Dept. 811
Roosevelt Blvd. & Haldeman Ave., Philadelphia 15, Pa.

How can YALE Gas Trucks do more—save money—for me?

☐ Please have your local representative call
☐ Please send my free copy of
THE PICTURE STORY OF YALE MATERIALS HANDLING EQUIPMENT

Company _____

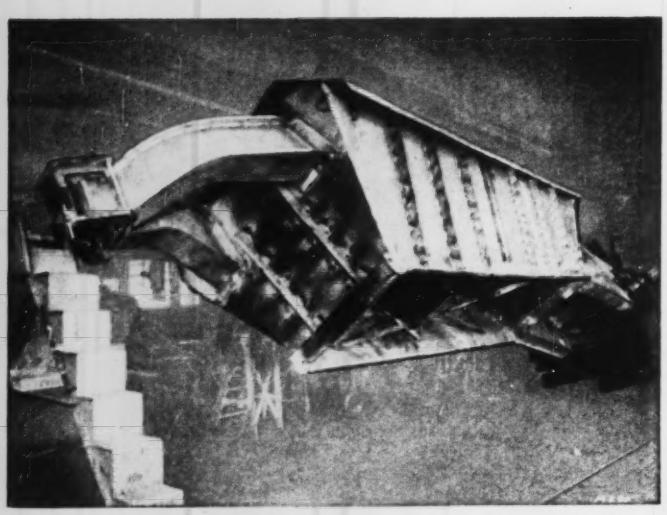
Name _____ Title _____

Street _____ City _____ State _____

In Canada write The Yale & Towne Manufacturing Company
Box 337—Postal Station "A"—Toronto

YALE

GAS AND ELECTRIC INDUSTRIAL TRUCKS • *WORKSAVERS*
HAND TRUCKS • HAND AND ELECTRIC HOISTS • PUL-LIFTS



VAN DORN

Weldments Feature

★ *Strength*
★ *Uniformity*
★ *Economy*

Yes, Van Dorn Weldments are widely known for their outstanding quality—for they are backed by Van Dorn's complete fabricating facilities . . . experienced design engineers . . . specially trained workmen . . . 77 years' experience in metal working.

Consult us about your requirements—no obligation, of course. The Van Dorn Iron Works Co., 2685 East 79th Street, Cleveland 4, Ohio.

Send For
FREE WELDMENT BOOK
● *Profusely illustrated; describes the many advantages of weldments, and Van Dorn's extensive facilities.*

NEW PRODUCTS and equipment

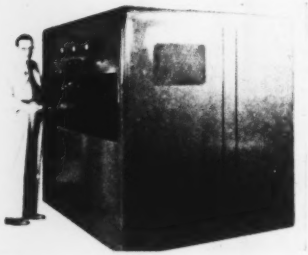
drills, straight shank or taper, right or left hand, from No. 80 up to 1-inch, can be gaged. F. T. Griswold Mfg. Co., Dept. ST, Devon, Pa.

USE REPLY CARD—CIRCLE No. 18

Induction Heating Units

. . . 50 kw at 400,000 cycles

High-frequency induction heating unit is built to provide more than 50 kw at 400,000 cycles per second on a 100 per cent duty cycle. Units are recommended for



heating and fabricating operations that call for production brazing, soldering, hardening, forging or shrink fitting.

Water consumption is determined by use; average at full load is 22½ gpm. Pressure is 20 to 80 pounds. The unit features a built-in closed water system that circulates water to the oscillator tube and tank coils. Lindberg Engineering Co., Dept. ST, 2450 W. Hubbard St., Chicago 12, Ill.

USE REPLY CARD—CIRCLE No. 19

Power Punch Press

. . . has increased throat depth

Throat depth of 24 inches, compared with a 12 and 18-inch depth in two former models, is available in No. 150 deep throat power punch press. Length of stroke is 2 inches, an increase of ¾-inch over other

USE A REPLY CARD
Just circle the corresponding number of any item in this section for more information.

Yours FOR THE ASKING

TEAR OUT CARD, FILL IN and MAIL TODAY!

71. Forging Presses

E. W. Bliss Co.—Complete specifications for line of high speed forging presses, offered in capacities ranging from 300 to 4000 tons, are found in 4-page catalog No. 42. Details of die seat, clutch, slide and frame construction are shown and specifications and dimensions are given.

72. Shipping By Air

Hinde & Dauch Paper Co.—24-page illustrated booklet No. 6 of the "Little Packaging Library" tells you "How to Ship by Air in Corrugated Boxes." It describes the various air freight services, outlines advantages of shipping by air, lists its restrictions and tells you how to prepare a package for air shipment. Booklet features an Airfreighter loading chart and presents some case histories.

73. Dryer Furnaces

Bigelow-Liptak Corp.—Advantages of unit-suspended walls in dryer furnaces for coal, lumber and other products are described in 4-page illustrated catalog 36. It relates how thin walls are deliberately made cool, minimizing heat losses and adding to furnace efficiency.

74. Hydraulic & Air Cylinders

Hanna Engineering Works—16 cylinder-powered movements and 21 actual applications are shown in 6-page technical bulletin "Cylinder Power in Action." Test describes how cylinder power can be utilized to speed production on all types of machines and equipment by push, pull, lift, press, clamp and control.

75. Direct-Fired Furnaces

Surface Combustion Corp.—Direct fuel-fired furnaces for all types of heat treat processing are subject of illustrated 4-page bulletin SC-156. Practical applications of direct fuel-fired batch and continuous furnace designs in ferrous and nonferrous industries are shown, and basic operating data are given for each example. Applications of convection heating and using auxiliary handling systems is included.

76. Pulsating Core Blower

Federal Foundry Supply Co.—Blowing of cores by the pulsating method—using two, three or four short, quick blows instead of one long blow, is the principle of the Pulsator model San-Blo. It is described and illustrated in 4-page bulletin P-1.

77. Weldments & Castings

Acme Tank & Welding Div., United Tool & Die Co.—Basic facts about steel plate fabrication as compared with castings are presented in 24-page illustrated booklet "The Facts About Weldments and Castings." Much data are in tabular form. If you specify castings, this booklet is a "must."

78. Spacer Fasteners

Prestole Corp.—Application and engineering data are among information on Prestole fasteners for spacer assemblies given in 2-page illustrated bulletin 215-A-5M. Data presented aid in proper selection of fasteners for use in assembly of toys and stove, refrigerator and automobile assemblies.

79. Plasticizers

Pittsburgh Coke & Chemical Co.'s Plasticizer Div. has prepared an illustrated 14-page booklet describing its line of plasticizers. It's divided into three parts: "Plastics . . . an Industry Comes of Age," "The Story of Pittsburgh PX Plasticizers," and a section on uses and properties of ten individual plasticizers offered. Back cover has complete product list.

STEEL
Penton Building, Cleveland 13, Ohio

11-3-52

Please send literature or detailed information on subjects circled at left to—

NAME TITLE

COMPANY

PRODUCTS MANUFACTURED

ADDRESS

CITY AND STATE

This card MUST be completely filled out. Please TYPE or PRINT

1	11	21	31	41	51	61	71	81
2	12	22	32	42	52	62	72	82
3	13	23	33	43	53	63	73	83
4	14	24	34	44	54	64	74	84
5	15	25	35	45	55	65	75	85
6	16	26	36	46	56	66	76	86
7	17	27	37	47	57	67	77	87
8	18	28	38	48	58	68	78	88
9	19	29	39	49	59	69	79	89
10	20	30	40	50	60	70	80	90

FIRST CLASS
Permit No. 36
(Sec. 349 P.L.&R.)
CLEVELAND, OHIO

BUSINESS REPLY CARD
No Postage Stamp Necessary if Mailed in the United States

POSTAGE WILL BE PAID BY—

STEEL
Penton Building
Cleveland 13, Ohio

Readers Service Dept.

80. Building Maintenance

Flexrock Co.—Do you want a 64-page handbook jammed with instructions and data on a complete line of building construction and maintenance products? If so, we suggest illustrated handbook No. 7 which deals with floor materials and finishes, construction and maintenance, leak stopping and moisture sealing. Step-by-step guidance is given on application of these products.

81. Investment Castings

Precision Metalsmiths, Inc.—Wide range of possible uses for investment castings and facilities for design and production offered by this company are outlined in well-illustrated 12-page booklet "Pour Yourself an Assembly". Step-by-step illustrations described the process and many different ferrous and nonferrous parts ranging from few ounces to 5 lb are shown.

82. Hydraulic Truck-Crane

Pitman Mfg. Co. — Applications, specifications general data and dimensional drawings can be found in this 8-page illustrated booklet on the Hydra-Lift hydraulic truck-crane. Unit fits on frame of any truck of 1½ tons or larger and offers a lifting capacity up to 6400 lb with a power-swinging boom. It requires only 40 in. behind the cab for installation.

83. Cutting Tools

Gairing Tool Co.—Detailed specifications and general information on the line of Gairing standard cutting tools are to be found in this 12-page illustrated 1952 catalog. Included are interchangeable counterbores, back spotfacers, core drills, block type boring tools and standard milling cutters. Many design features are shown.

84. Elevated Steel Tanks

Pittsburgh-Des Moines Steel Co.—20 pages of this bulletin No. 101 contain 50 installation photographs of five types of elevated steel tanks for water storage. Capacities range from 25,000 to 3,000,000 gallons. Included for each type is a table of tank dimensions and other data for various sizes available.

85. Forging Furnace

Delaware Tool Steel Corp.—Principle of operation and design features of Forgeatrol furnace are outlined in illustrated bulletin DF-2 of 6 pages. Cold shank heating is possible in these furnaces which have even heating from wall to wall. Models available and specification of each are included.

86. Steel Conveyor Belt

May-Fran Engineering, Inc. — If your plant handles metal scrap, hot forgings, flash, wet or dry metal chips and turnings or other sharp and abrasive materials, you should be interested in the hinged steel conveyor belt described and illustrated in 4-page catalog No. MF-530. Belt can be assembled in almost any width or length from stocked components.

EDITORIAL REPRINTS:

87. Metal Recovery

Ion exchange processes are opening the door to new developments in the recovery of spent baths and metals for reuse. In STEEL reprint entitled "Ion Exchange—New Hope for Waste Recovery" Dr. A. G. Gray describes this salvaging process which is attractive both for reuse of constitutents and to ease the load on plant waste treatment.

88. Blast Furnace Design

O. R. Rice, Metallurgical Engineer, Koppers Co., in STEEL reprint "No Drastic Change Seen in American Blast Furnace Design" describes old and new ideas on furnace layout. He also covers modern equipment such as automatic charging control, pneumatic bell hoists and the handling of coke breeze and gas cleaning equipment.

89. Heating Installation

R. B. Richards in STEEL reprint "Heating Installation Cost Cut in Half" tells how Vahl Engineering Co. saved 49 per cent of the estimated cost of their new plant's heating system by installation of gas fired unit heaters. Employee comfort, lower fuel bills and adaptability of the system to future expansion are other benefits derived.

90. Friction Sawing

"Band Saw Walks Through Metal" is title of STEEL reprint in which M. A. Bergson of DoALL Co. relates how friction sawing is coming into its own in many production sawing jobs. Bands moving at speeds up to 15,000 fpm can cut sheet steel panels at rates of up to 140 linear fpm.

BUSINESS REPLY CARD

No Postage Stamp Necessary if Mailed in the United States

POSTAGE WILL BE PAID BY—

STEEL

Penton Building

Cleveland 13, Ohio

Readers Service Dept.

FIRST CLASS
Permit No. 36
(Sec. 34.9 P.L.&R.)
CLEVELAND, OHIO

STEEL

Penton Building, Cleveland 13, Ohio

11-3-52

Please send literature or detailed information on subjects circled at left to—

1	11	21	31	41	51	61	71	81
2	12	22	32	42	52	62	72	82
3	13	23	33	43	53	63	73	83
4	14	24	34	44	54	64	74	84
5	15	25	35	45	55	65	75	85
6	16	26	36	46	56	66	76	86
7	17	27	37	47	57	67	77	87
8	18	28	38	48	58	68	78	88
9	19	29	39	49	59	69	79	89
10	20	30	40	50	60	70	80	90

NAME

TITLE

COMPANY

PRODUCTS MANUFACTURED

ADDRESS

CITY AND STATE

This card MUST be completely filled out. Please TYPE or PRINT

NEW PRODUCTS and equipment

models. Press has a nonrepeat clutch that can be released for automatic feed.

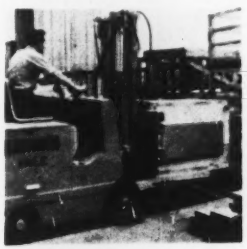
Capacity is 10 tons; speed rating, 175 strokes per minute. Rear location of flywheel is designed to permit easier stock feeding and provide a greater margin of operator safety. Whitney Metal Tool Co., Dept. ST, Rockford, Ill.

USE REPLY CARD—CIRCLE No. 20

Small Truck Clamp

. . .attaches to 2000-pound model

This 2000-pound electric truck has clamping attachment for handling lightweight packages in stor-



age areas, on docks and in trailers. The hydraulically-powered attachment opens to accommodate crates as wide as 60 inches. Truck lifts the crates to a 130-inch height for stacking. Yale & Towne Mfg. Co., Dept. ST, Philadelphia 15, Pa.

USE REPLY CARD—CIRCLE No. 21

Magnesium Dock Board

. . .for truck loading operations

Dockboard of all magnesium construction combines bridge design strength with lightness and easy one-man handling. Designed for use in truck loading operations, it is made in two rated load capacities: 1000 pounds per axle and 2000 pounds per axle. Magline Inc., Dept. ST, Pinconning, Mich.

USE REPLY CARD—CIRCLE No. 22

USE A REPLY CARD

Just circle the corresponding number of any item in this section for more information.

IN THE BRASS AND COPPER INDUSTRY

Using the Sperry Reflectoscope for fast, dependable, 100% inspection of large Everdur plates helps The American Brass Company assure customer satisfaction.

The versatile Reflectoscope is here used by The American Brass Company to inspect cupro-nickel condenser plates.

NO REJECTS Since Installing

Sperry

ULTRASONIC TESTING

Reflectoscope testing of work rolls protects against failure on the job with consequent work spoilage.

Two years ago The American Brass Company adopted Sperry Ultrasonic Reflectoscope testing for their Everdur plate. Since that time, *not a single plate* has been rejected by a customer. Accurately and dependably locating laminations and other internal defects not detectable by visual inspection, the Reflectoscope provides rapid, non-destructive testing that helps to maintain an enviable reputation for uniform high quality.

Penetrating up to 24 feet in solid metal, the Reflectoscope is also used to inspect a wide variety of other forms and materials in the brass and copper industry.

Learn how you can reduce testing costs and improve quality control in your plant. Write today for complete information about the Sperry Reflectoscope . . . for sale, or for lease. Ask about Sperry's day to day Testing Service.

Sperry

SPERRY PRODUCTS, INC.
611 SHELTER ROCK ROAD
Danbury, Connecticut
REPRESENTATIVES IN PRINCIPAL CITIES

A few words about

GRAINAL ALLOYS

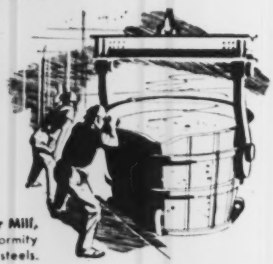
and how they are

Metallurgically Engineered

to produce greater uniformity in your boron treated steels

In our Laboratories every aspect of Grainal Alloys is carefully studied.

In our Plant exacting methods of production protect the quality of Grainal Alloys.



In your Mill, greater uniformity in your boron steels.

Uniformity. Consistent Results.

These are the demands of today's steelmaker. To make certain they are answered, we have *metallurgically engineered* our Grainal alloys.

In our laboratories, in our plant, every care is taken to insure a product of the correct composition and highest quality.

Result: A uniform product that enables you to produce steels of consistently high hardenability. And note—with Grainal you achieve this result with a minimum boron addition.

VANADIUM CORPORATION OF AMERICA

VANCORAM

420 Lexington Avenue, New York 17, N. Y.
Detroit • Chicago • Cleveland • Pittsburgh

MAKERS OF ALLOYS, CHEMICALS AND METALS

The Market Outlook

AN EASE-OFF in government restrictions on steel buying is in the making for the first quarter of 1953.

The relaxation may permit users to buy an additional 1,480,000 tons of finished steel in those three months.

The thaw will not apply to all finished steel products. It will be restricted to products which are most plentiful. Were it done otherwise, the demand for scarce products, such as large size carbon bars, heavy plates and seamless tubing, would be made even heavier.

SHAPING UP—Consideration of the increase is far enough along that the National Production Authority is thinking of recommending it to the Defense Production Administration, the agency which issues steel allotments.

Making the allotment increase necessary is the steel industry's expansion program. New capacity has been coming into operation all this year, but particularly in the last half.

The capacity increase has made it possible for steel to be produced in the last several weeks at an annual rate of 115 million net tons. At the beginning of this year the rate was 108 million tons. By January, the industry's ingot capacity should be around 117 million tons.

OUTLOOK—Appraising the outlook for operations, Benjamin F. Fairless, head of U. S. Steel Co., says that company should continue at capacity through the first quarter of next year.

Need for additional allotments was brought to the forefront by the automotive industry. It is going ahead with plans for normal production in the first quarter of 1953 on the strong hope it will receive additional steel.

PRELUDE—Increase in allotments and a continued rise in capacity are forerunners of a clamor for junking of controls on production and distribution of steel. A move in this direction was made by the American Institute of Steel Construction, an association of more than 280 companies which fabricate structural steel for buildings, bridges and other structures. It asks that all government controls on building construction be removed so that advance planning necessary in the construction field can be resumed.

Industrial steel warehousemen ask that secondary steel products be decontrolled and that the requirement that warehouses hold 50 per cent of incoming shipments of some steel products 15 days for possible military demand be revoked or revised.

IN CONTRAST—On the other hand the Steel Plate Fabricators Association, Chicago, urged the DPA to keep in full force at least through the second quarter of 1953 the directive requiring strip mills to roll light plates. Heavy plates are in strong demand because of the defense program. To permit mills able to roll heavy plates to concentrate on the heavy product, the government requires strip mills to devote part of their rolling time to light plates.

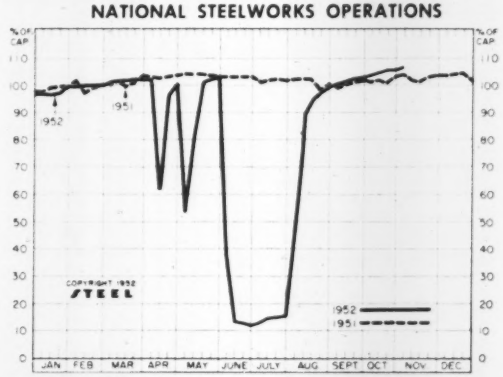
RECORD PACE—Meanwhile, mills continue to pour a record tonnage of steel. Estimated national rate of output rose 1 point in the week ended Nov. 1 to 106.5 per cent of capacity, equal to production of about 2.2 million net tons of steel for ingots and castings.

Although steel production generally is on the upgrade, mills in the Pacific Northwest are worried over the possibility of a drought-engendered shortage of hydroelectric power.

Hampering the distribution of steel from Pittsburgh mills was a truckers' strike.

PRICE CUTS—Prices of galvanized steel products were reduced to reflect the drop in the zinc price to 12.5 cents a pound. Cast iron pipe prices softened. In the East, direct bids bring out quotations $10 a ton under list prices on sizes 6 to 12 inches. Distributors of buttweld steel pipe are shading markups in western Massachusetts. Most distributors in that area are taking full allotments of merchant steel pipe, but some of them indicate they may cut back moderately on January or February purchases.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

Percentage of Capacity Engaged at Leading Production Points

	Week Ended Nov. 1	Change	Same Week 1951	Same Week 1950
Pittsburgh	106	0.5	103	104
Chicago	111	+ 0.5	109	106
Mid-Atlantic	99	0	101	100
Youngstown	106	+ 1	106	106
Wheeling	98	2	101.5	98
Cleveland	113	0.5*	103.5	97.5
Buffalo	106	+ 11	104	29
Birmingham	107	+ 1	60	100
New England	85	+ 6	99	91
Cincinnati	90	0	103	106
St. Louis	98.5	11.5	91	88.5
Detroit	108	+ 2*	101.5	106
Western	108	+ 5	105	99
Estimated national rate	106.5	+ 1	104	98.5

Based on weekly steelmaking capacity of 2,072,040 tons in 1952, 1,969,044 tons for 1951, 1,928,721 tons for second half 1950, 1,906,268 tons for first half 1950.

* Change from revised rate for preceding week.

The Metalworking Outlook—p. 55 *Production Engineering News*—p. 91

Composite Market Averages

FINISHED STEEL PRICE INDEX	Oct. 28 1952	Oct. 21 1952	Month Ago	October Average
Bureau of Labor Statistics (1947-1949 = 100)	130.5	130.7	130.8	130.7

AVERAGE PRICES (BUREAU OF LABOR STATISTICS)
Week Ended Oct. 28, 1952

Units are 100 lb except where otherwise noted below in parentheses. For complete description of products see insert following p. 28, STEEL, Sept. 8, 1952.

Rails	$3.775	Sheets, C.R. carbon	$5.275
Track spikes	6.850	Sheets, galv.	6.515
Track bolts	9.958	Strip, C.R. carbon	5.100
Tie plates	4.775	Strip, C.R. stainless (lb)	0.325
Joint bars	4.925	Pipe, black, buttweld (100 ft)	7.090
Plates, carbon	4.150	Pipe, galv., buttweld (100 ft)	8.887
Structural shapes	4.200	Boiler tubes (100 ft)	31.663
Bars, tool steel (lb)	1.576	Tin plate (100 lb base box)	8.950
Bars, 4120 alloy	6.575	Terne plate (100 lb base box)	7.750
Bars, stainless (lb)	0.149	Wire, carbon, merchant	6.075
Bars, carbon	4.100	Wire fence, galv.	6.458
Bars, reinforcing	4.050	Nails (100 lb kegs)	7.390
Bars, C.F. carbon	5.925	Wire, barbed (80 rod spools)	5.920
Sheets, H.R. carbon	4.125	Woven wire fence (20 rod rolls)	13.720

FINISHED PRICE INDEX, Weighted

Calculated by STEEL*	Oct. 30 1952	Week Ago	Month Ago	Year Ago	5 Yrs Ago
Index (1935-39 av. 100)	181.31	181.31	181.31	171.92	128.96
Index in cents per lb	4.912	4.912	4.912	4.657	3.494

ARITHMETICAL PRICE COMPOSITES
Calculated by STEEL*

Finished Steel, NT	$110.98	$110.98	$110.98	$106.32	$75.41
No. 2 Fdry. Pig Iron, GT	55.04	55.04	55.04	52.24	36.59
Basic Pig Iron, GT	54.66	54.66	54.66	52.16	36.13
Malleable Pig Iron, GT	55.77	55.77	55.77	53.27	37.13
Steelmaking Scrap, GT	43.00	43.00	43.00	43.00	40.25

* For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54, of arithmetical price composites, STEEL, Sept. 1, 1952, p. 130.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED MATERIALS	Oct. 30 1952	Week Ago	Month Ago	Year Ago	5 Yrs Ago
Bars, H.R., Pittsburgh	3.95	3.95	3.95	3.70	2.90
Bars, H.R., Chicago	3.95	3.95	3.95	3.70	2.90
Bars, H.R. del. Philadelphia	4.502	4.502	4.502	4.223	3.318
Bars, C.F., Pittsburgh	4.925	4.925	4.925	4.55	3.55
Shapes, Std., Pittsburgh	3.85	3.85	3.85	3.65	2.80
Shapes, Std., Chicago	3.85	3.85	3.85	3.65	2.80
Shapes, del. Philadelphia	4.13	4.13	4.13	3.918	2.954
Plates, Pittsburgh	3.90	3.90	3.90	3.70	2.95
Plates, Chicago	3.90	3.90	3.90	3.70	2.95
Plates, Coatesville, Pa.	4.35	4.35	4.35	4.15	3.15
Plates, Sparrows Point, Md.	3.90	3.90	3.90	3.70	2.95
Plates, Claymont, Del.	4.35	4.35	4.35	4.15	3.15
Sheets, H.R., Pittsburgh	3.775	3.775	3.775	3.60-75	2.80
Sheets, H.R., Chicago	3.775	3.775	3.775	3.60	2.80
Sheets, C.R., Pittsburgh	4.575	4.575	4.575	4.35	3.55
Sheets, C.R., Chicago	4.575	4.575	4.575	4.35	3.55
Sheets, C.R., Detroit	4.775	4.775	4.775	4.55	3.70
Sheets, Galv., Pittsburgh	5.075	5.075	5.075	4.80	3.90
Strip, H.R., Pittsburgh	3.75-4.225	3.75-4.225	3.75-4.225	3.75-4.00	2.80
Strip, H.R., Chicago	3.725	3.725	3.725	3.50	2.80
Strip, C.R., Pittsburgh	5.10-5.80	5.10-5.80	5.10-5.80	4.85-5.35	3.55
Strip, C.R., Chicago	5.35	5.35	5.35	4.90	3.65
Strip, C.R., Detroit	5.30-6.05	5.30-6.05	5.30-6.05	4.85-5.60	3.70
Wire, Basic, Pittsburgh	5.10-5.225	5.10-5.225	5.10-5.225	4.85-5.10	3.675
Nails, Wire, Pittsburgh	6.20-6.35	6.20-6.35	6.20-6.35	5.90-6.20	4.25
Tin plate box, Pittsburgh	$8.95	$8.95	$8.95	$8.70	$5.75

SEMIFINISHED					
Billets, forging, Pitts. (NT)	$70.50	$70.50	$70.50	$66.00	$56.50
Wire rods, ⅜"-⅝", Pitts.	4.325	4.325	4.325	4.10-30	2.925

PIG IRON, Gross Ton					
Bessemer, Pitts.	$55.50	$55.50	$55.50	$53.00	$37.00
Basic, Valley	54.50	54.50	54.50	52.00	36.00
Basic, del. Phila.	56.25	56.25	56.25	56.61	38.84
No. 2 Fdry., Pitts.	55.00	55.00	55.00	52.50	36.50
No. 2 Fdry., Chicago	55.00	55.00	55.00	52.50	36.00
No. 2 Fdry., Valley	55.00	55.00	55.00	52.50	36.50
No. 2 Fdry. del. Phila.	59.75	59.75	59.75	57.11	39.34
No. 2 Fdry., Birm.	51.38	51.38	51.38	48.88	34.88
No. 2 Fdry., Birm., del. Cin.	58.93	58.93	58.93	55.43	38.74
Malleable, Valley	55.00	55.00	55.00	52.50	36.50
Malleable, Chicago	55.00	55.00	55.00	52.50	36.50
Charcoal, Lyles, Tenn.	68.50	68.50	68.50	66.00	50.00
Ferromanganese, Basa, Pa.	228.00	228.00	228.00	188.00	151.00*

* F.o.b. cars, Pittsburgh.

SCRAP, Gross Ton (including broker's commission)					
No. 1 Heavy Melt., Pitts.	$44.00	$44.00	$44.00	$44.00	$40.00
No. 1 Heavy Melt., E. Pa.	41.50	41.50	41.50	42.50	42.00
No. 1 Heavy Melt., Chicago	42.50	42.50	42.50	42.50	38.75
No. 1 Heavy Melt., Valley	44.00	44.00	44.00	44.00	43.00
No. 1 Heavy Melt., Cleve.	43.00	43.00	43.00	43.00	41.75
No. 1 Heavy Melt., Buffalo	43.00	43.00	43.00	43.00	42.50
Rails, Rerolling, Chicago	52.00	52.00	52.00	52.50	55.00
No. 1 Cast, Chicago	50.00	50.00	50.00	49.00	49.00

† F.o.b. shipping point.

COKE, Net Ton					
Beehive, Furn. Connsvl.	$14.75	$14.75	$14.75	$14.75	$12.00-12.50
Beehive, Fdry., Connsvl.	17.00	17.00	17.00	17.50	14.00-15.00
Oven, Fdry., Chicago	23.00	23.00	23.00	23.00	17.50

PIG IRON

F.o.b. furnace prices quoted under GCPR as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax. Key to producing companies published on second following page.

PIG IRON, Gross Ton	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem,Pa. B2	$56.50	$57.00	$57.50	$58.00
NewYork, del.		60.78	61.28	
Newark, del.	58.52	60.02	60.52	61.02
Philadelphia, del.	59.25	59.75	60.25	60.75
Birmingham District				
AlabamaCity,Ala. R2	50.88	51.38		
Birmingham, R2	50.88	51.38		
Birmingham, S9		51.38		
Woodward,Ala. W15	50.88	51.38		
Cincinnati, del.		58.93		
Buffalo District				
Buffalo, R2	54.50	55.00	55.50	
Buffalo, H1	54.50	55.00	55.50	
Tonawanda,N.Y. W12	54.50	55.00	55.50	
No.Tonawanda,N.Y. T9		55.00	55.50	
Boston, del.	65.15	65.65	66.15	
Rochester,N.Y. del.	57.52	58.02	58.52	
Syracuse,N.Y. del.	58.62	59.12	59.62	
Chicago District				
Chicago, I-3	54.50	55.00	55.00	55.50
Gary,Ind. U5	54.50		55.00	
IndianaHarbor,Ind. I-2	54.50		55.00	
So.Chicago,Ill. W14	54.50	55.00	55.00	
So.Chicago,Ill. Y1	54.50	55.00	55.00	
So.Chicago,Ill. U5	54.50		55.00	55.50
Milwaukee, del.	56.67	57.17	57.17	57.67
Muskegon,Mich. del.		61.30	61.30	
Cleveland District				
Cleveland, A7	54.50	55.00	55.00	55.50
Cleveland, R2	54.50	55.00	55.00	
Akron,O., del. from Cleve.	57.11	57.61	57.61	58.11
Lorain,O. N3	54.50			55.50
Duluth, I-3			55.00	
Erie,Pa. I-3	54.50	55.00	55.00	55.50
Everett,Mass. E1		59.25	59.75	
Fontana,Calif. K1	60.50	61.00		
GraniteCity,Ill. G4	56.40	56.90	57.40	
St.Louis, del. (inc. tax)	57.15	57.65	58.15	
Ironton,Utah C11	54.50	55.00		
Geneva,Utah C11	54.50	55.00		
LoneStar,Tex. L6	50.50	*51.00	51.00	
Minnequa,Colo. C10	56.50	57.50	57.50	
Rockwood,Tenn. T3			58.50	
Pittsburgh District				
Nevillelsland,Pa. P6		55.00	55.00	55.50
Pitts., N.&S. sides, Ambridge				
Aliquippa, del.		56.37	56.37	56.87
McKeesRocks, del.		56.04	56.04	56.54
Lawrenceville, Homestead				
Wilmerding, Monaca, del.		56.66	56.66	57.16
Verona, Trafford, del.		57.19	57.19	57.69
Brackenridge, del.		57.45	57.45	57.95
Bessemer,Pa. U5	54.50		55.00	55.50
Clairton,Rankin,So.Duquesne,Pa. U5	54.50			
McKeesport,Pa. N3	54.50			55.50
Monessen,Pa. P7	56.50			
Sharpsville,Pa. S6			55.00	55.50
Steelton,Pa. B2	56.50	57.00	57.50	58.00
Swedeland,Pa. A3	58.50	59.00	59.50	60.00
Toledo,O. I-3	54.50	55.00	55.00	55.50
Cincinnati, del.	59.97	60.47		
Troy,N.Y. R2	56.50	57.00	57.50	58.00
Youngstown District				
Hubbard,O. Y1	54.50	55.00	55.00	
Youngstown, Y1	54.50	55.00	55.00	
Youngstown, U5	54.50			55.50
Mansfield,O., del.	59.15	59.65	59.65	60.15

* Low phos. southern grade.

PIG IRON DIFFERENTIAL

Silicon: Add 50 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%.

Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, incl., add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.0-6.50% silicon; add $1.50 for each 0.5% Si)

Jackson,O. G2, J1	$65.50
Buffalo, H1	66.75

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1 for each 0.5% Mn over 1%; $2 per gross ton premium for 0.045% max P)

NiagaraFalls,N.Y. P15	$91.00
Keokuk,Iowa, Openhearth & Fdry., frt. allowed K2	92.50
Keokuk, OH & Fdry., 12½ lb piglets, 16% Si, frt. allowed K2	95.50
Wenatchee,Wash., OH & Fdry., frt. allowed K2	92.50

CHARCOAL PIG IRON, Gross Ton

(Low phos, semi-cold blast; differential charged for silicon over base grade; also for hard chilling iron Nos. 5 & 6)

Lyles,Tenn. T3	$68.50

LOW PHOSPHORUS PIG IRON, Gross Ton

Cleveland, intermediate, A7	$59.50
Steelton,Pa. B2	62.50
Philadelphia, delivered	66.05
Troy,N.Y. R2	62.50

(Material in this department is protected by copyright and its use in any form without permission is prohibited)

Semifinished and Finished Steel Products

Mill prices quoted under GCFR as reported to STEEL, Oct. 30, 1952, cents per pound except as otherwise noted. Changes shown in italics. Code numbers following mill points indicate producing company, key on next two pages.

INGOTS, Carbon, Forging (NT)
Fontana,Calif. K1 . . . $81.00
Munhall,Pa. U5 . . . . . 54.00
Seattle S24 . . . . . 75.00

INGOTS, Alloy (NT)
Detroit R7 . . . . . $57.00
Fontana,Calif. K1 . . . . 83.00
Houston S5 . . . . . 65.00
Midland,Pa. C18 . . . . 54.00
Munhall,Pa. U5 . . . . . 57.00

BILLETS, BLOOMS & SLABS
Carbon, Rerolling (NT)
Bessemer,Pa. U5 . . . . $59.00
Clairton,Pa. U5 . . . . . 59.00
Ensley,Ala. T2 . . . . . 59.00
Fairfield,Ala. T2 . . . . 59.00
Fontana,Calif. K1 . . . . 78.00
Gary,Ind. U5 . . . . . 59.00
Johnstown,Pa. B2 . . . . 59.00
Lackawanna,N.Y. B2 . . 59.00
Munhall,Pa. U5 . . . . . 59.00
So.Chicago,Ill. U5 . . . . 59.00
So.Duquesne,Pa. U5 . . . 59.00

Carbon, Forging (NT)
Bessemer,Pa. U5 . . . . $70.50
Buffalo R2 . . . . . 70.50
Canton,O. R2 . . . . . 70.50
Clairton,Pa. U5 . . . . . 70.50
Cleveland R2 . . . . . 70.50
Conshohocken,Pa. A3 . . 77.50
Detroit R7 . . . . . 73.50
Ensley,Ala. T2 . . . . . 70.50
Fairfield,Ala. T2 . . . . 70.50
Fontana,Calif. K1 . . . . 89.50
Gary, Ind U5 . . . . . 70.50
Geneva,Utah C11 . . . . 70.50
Houston S5 . . . . . 78.50
Johnstown,Pa. B2 . . . . 70.50
Lackawanna,N.Y. B2 . . 70.50
LosAngeles B3 . . . . . 89.50
Munhall,Pa. U5 . . . . . 70.50
Seattle B3 . . . . . 89.50
So.Chicago R2,U5,W14 . . 70.50
So.Duquesne,Pa. U5 . . . 70.50
So.SanFrancisco B3 . . . 89.50

Alloy, Forging (NT)
Bethlehem,Pa. B2 . . . $76.00
Buffalo R2 . . . . . 76.00
Canton,O. R2 . . . . . 76.00
Canton,O. T7 . . . . . 78.60
Conshohocken,Pa. A3 . . 83.00
Detroit R7 . . . . . 79.00
Fontana,Calif. K1 . . . . 95.00
Gary,Ind. U5 . . . . . 76.00
Houston S5 . . . . . 84.00
Ind.Harbor,Ind. Y1 . . . 76.00
Johnstown,Pa. B2 . . . . 76.00
Lackawanna,N.Y. B2 . . 76.00
LosAngeles B3 . . . . . 96.00
Massillon,O. R2 . . . . . 76.00
Midland,Pa. C18 . . . . 70.00
Munhall,Pa. U5 . . . . . 76.00
So.Chicago R2,U5,W14 . . 76.00
So.Duquesne,Pa. U5 . . . 76.00
Struthers,O. Y1 . . . . . 76.00
Warren,O. C17 . . . . . 76.00

ROUNDS, SEAMLESS TUBE (NT)
Buffalo R2 . . . . . $87.50
Canton,O. R2 . . . . . 87.50
Cleveland R2 . . . . . 87.50
Fontana,Calif. K1 . . . . 108.50
Gary,Ind. U5 . . . . . 87.50
Massillon,O. R2 . . . . . 87.50
So.Chicago,Ill. R2 . . . . 87.50
So.Duquesne,Pa. U5 . . . 87.50

SHEET BARS (NT)
Fontana,Calif. K1(43) . $89.00

SKELP
Aliquippa,Pa. J5 . . . . $3.65
Munhall,Pa. U5 . . . . . 3.55
Warren,O. R2 . . . . . 3.55
Youngstown R2, U5 . . . 3.55

WIRE RODS
Alton,Ill. L1 . . . . . 4.70
AlabamaCity,Ala. R2 . . 4.325
Buffalo W12 . . . . . 4.325
Cleveland A7 . . . . . 4.325
Donora,Pa. A7 . . . . . 4.325
Fairfield,Ala. T2 . . . . 4.325
Fontana,Calif. K1 . . . . 5.125
Houston S5 . . . . . 4.725
Johnstown,Pa. B2 . . . . 4.325
Joliet,Ill. A7 . . . . . 4.325
KansasCity,Mo. S5 . . . . 4.665
LosAngeles B3 . . . . . 5.125
Minnequa,Colo. C10 . . . 4.575
Monessen,Pa. P7 . . . . . 4.525
No.Tonawanda,N.Y.B11 . 4.325
Pittsburg,Calif. C11 . . . 4.975
Portsmouth,O. P12 . . . . 4.525
Roebling,N.J. R5 . . . . . 4.425
So.Chicago,Ill. R2 . . . . 4.325
SparrowsPoint,Md. B2 . . 4.425
Sterling,Ill.(1) N15 . . . . 4.325
Struthers,O. Y1 . . . . . 4.325
Torrance,Calif. C11 . . . 5.125
Worcester,Mass. A7 . . . 4.625

SHEET STEEL PILING
Ind.Harbor,Ind. I-2 . . . 4.675
Lackawanna,N.Y. B2 . . 4.675
Munhall,Pa. U5 . . . . . 4.675
So.Chicago,Ill. U5 . . . . 4.675

STRUCTURALS
Carbon Steel Stand. Shapes
AlabamaCity,Ala. R2 . . 3.85
Aliquippa,Pa. J5 . . . . . 3.85
Bessemer,Ala. T2 . . . . 3.85
Bethlehem,Pa. B2 . . . . 3.90
Clairton,Pa. U5 . . . . . 3.85
Fairfield,Ala. T2 . . . . 3.85
Fontana,Calif. K1 . . . . 4.45
Gary,Ind. U5 . . . . . 3.85
Geneva,Utah C11 . . . . 3.85
Houston S5 . . . . . 4.25
Ind.Harbor,Ind. I-2 . . . 3.85
Johnstown,Pa. B2 . . . . 3.90
KansasCity,Mo. S5 . . . . 4.45
Lackawanna,N.Y. B2 . . 3.90
LosAngeles B3 . . . . . 4.45
Minnequa,Colo. C10 . . . 4.30
Munhall,Pa. U5 . . . . . 3.85
Niles,Calif.(22) P1 . . . 4.56
Phoenixville,Pa. P4 . . . 6.10
Seattle B3 . . . . . 4.50
So.Chicago,Ill. U5, W14 3.85
So.SanFrancisco B3 . . . . 4.40
Torrance,Calif. C11 . . . . 4.45
Weirton,W.Va. W6 . . . . 4.10

Wide Flange
Bethlehem,Pa. B2 . . . . 3.90
Clairton,Pa. U5 . . . . . 3.85
Fontana,Calif. K1 . . . . 4.85
Johnstown,Pa. B2 . . . . 3.90
Lackawanna,N.Y. B2 . . 3.90
Munhall,Pa. U5 . . . . . 3.85
So.Chicago,Ill. U5 . . . . 3.85

Alloy Stand. Shapes
Clairton,Pa. U5 . . . . . 4.725
Fontana,Calif. K1 . . . . 5.925
Gary,Ind. U5 . . . . . 4.725
Munhall,Pa. U5 . . . . . 4.725
So.Chicago,Ill. U5 . . . . 4.725

H.S., L.A. Stand. Shapes
Aliquippa,Pa. J5 . . . . . 5.80
Bessemer,Ala. T2 . . . . 5.80
Bethlehem,Pa. B2 . . . . 5.80
Clairton,Pa. U5 . . . . . 5.80
Fairfield,Ala. T2 . . . . 5.80
Fontana,Calif. K1 . . . . 6.40
Gary,Ind. U5 . . . . . 5.80
Geneva,Utah C11 . . . . 5.80
Ind.Harbor,Ind. I-2 . . . 5.80
Ind.Harbor,Ind. Y1 . . . 6.30
Johnstown,Pa. B2 . . . . 5.80
Lackawanna,N.Y. B2 . . 5.80
LosAngeles B3 . . . . . 6.35
Munhall,Pa. U5 . . . . . 5.80
Seattle B3 . . . . . 6.40
So.Chicago,Ill. U5 . . . . 5.80
So.SanFrancisco B3 . . . . 6.30
Struthers,O. Y1 . . . . . 6.30

H.S., L.A. Wide Flange
Aliquippa,Pa. J5 . . . . . 5.50
Bethlehem,Pa. B2 . . . . 5.80
Lackawanna,N.Y. B2 . . 5.80
Munhall,Pa. U5 . . . . . 5.75
So.Chicago,Ill. U5 . . . . 5.75

BEARING PILES
Munhall,Pa. U5 . . . . . 3.85
So.Chicago,Ill. U5 . . . . 3.85

PLATES,High-Strength Low-Alloy
Aliquippa,Pa. J5 . . . . . 5.95
Bethlehem,Pa. B2 . . . . 5.95
Clairton,Pa. U5 . . . . . 5.95
Cleveland J5, R2 . . . . 5.95
Conshohocken,Pa. A3 . . 6.20
Ecorse,Mich. G5 . . . . . 6.90
Fairfield,Ala. T2 . . . . 5.95
Fontana,Calif.(30) K1 . . 6.55
Gary,Ind. U5 . . . . . 5.95
Geneva,Utah C11 . . . . 5.95
Ind.Harbor,Ind. I-2 . . . 5.95
Ind.Harbor,Ind. Y1 . . . 6.45
Johnstown,Pa. B2 . . . . 5.95
Munhall,Pa. U5 . . . . . 5.95
Pittsburgh J5 . . . . . 5.95
Seattle B3 . . . . . 6.85
Sharon,Pa. S3 . . . . . 5.95
So.Chicago,Ill. U5 . . . . 5.95
SparrowsPoint,Md. B2 . . 5.95
Warren,O. R2 . . . . . 5.95
Youngstown Y1 . . . . . 6.45
Youngstown U5 . . . . . 5.95

PLATES, Open-Hearth Alloy
Claymont,Del. C22 . . . . 5.35
Coatesville,Pa. L7 . . . . 5.75
Conshohocken,Pa. A3 . . 5.55
Fontana,Calif. K1 . . . . 6.20
Gary,Ind. U5 . . . . . 5.25
Johnstown,Pa. B2 . . . . 5.25
Munhall,Pa. U5 . . . . . 5.25
Sharon,Pa. S3 . . . . . 5.70
So.Chicago,Ill. U5 . . . . 5.25
SparrowsPoint,Md. B2 . . 5.25

FLOOR PLATES
Cleveland J5 . . . . . 4.95
Conshohocken,Pa. A3 . . 4.95
Ind.Harbor,Ind. I-2 . . . 4.95
Munhall,Pa. U5 . . . . . 4.95
So.Chicago,Ill. U5 . . . . 4.95

PLATES, Ingot Iron
Ashland,c.l. (15) A10 . . 4.15
Cleveland,c.l. R2 . . . . . 4.50
Warren,O.c.l. R2 . . . . . 4.50

PLATES, Carbon Steel
AlabamaCity,Ala. R2 . . 3.90
Aliquippa,Pa. J5 . . . . . 3.90
Ashland,Ky. (15); A10 . . 3.90
Bessemer,Ala. T2 . . . . 3.90
Clairton,Pa. U5 . . . . . 3.90
Claymont,Del. C22 . . . . 4.25
Cleveland J5, R2 . . . . 3.90
Coatesville,Pa. L7 . . . . 4.35
Conshohocken,Pa. A3 . . 4.35
Ecorse,Mich. G5 . . . . . 4.45
Fairfield,Ala. T2 . . . . 3.90
Fontana,Calif.(30) K1 . . 4.50
Gary,Ind. U5 . . . . . 3.90
GraniteCity,Ill. G4 . . . 4.60
Geneva,Utah C11 . . . . 3.90
Harrisburg,Pa. C5 . . . . 6.50
Houston S5 . . . . . 4.30
Ind.Harbor,Ind. I-2, Y1 3.90
Johnstown,Pa. B2 . . . . 3.90
Lackawanna,N.Y. B2 . . 3.90
Minnequa,Colo. C10 . . . 4.70
Munhall,Pa. U5 . . . . . 3.90
Pittsburgh J5 . . . . . 3.90
Seattle B3 . . . . . 4.80
Sharon,Pa. S3 . . . . . 4.15
So.Chicago,Ill. U5, W14 3.90
SparrowsPoint,Md. B2 . . 3.90
Steubenville,O. W10 . . . 3.90
Warren,O. R2 . . . . . 3.90
Weirton,W.Va. W6 . . . . 4.20
Youngstown R2, U5, Y1 3.90

PLATES, Carbon A.R.
Fontana,Calif. K1 . . . . 5.65
Geneva,Utah C11 . . . . 5.05

PLATES, Wrought Iron
(Add 4.7% to base and extras)
Economy,Pa. B14 . . . . . 8.60

BARS, Hot-Rolled Carbon
AlabamaCity,Ala. R2 . . 3.95
Aliquippa,Pa. J5 . . . . . 3.95
Alton,Ill. L1 . . . . . 4.50
Atlanta,Ga. A11 . . . . . 4.50
Bessemer,Ala. T2 . . . . 3.95
Buffalo R2 . . . . . 3.95
Canton,O. R2 . . . . . 3.95
Clairton,Pa. U5 . . . . . 3.95
Cleveland R2 . . . . . 3.95
Detroit R7 . . . . . 4.10
Ecorse,Mich. G5 . . . . . 4.30
Emeryville,Calif. J7 . . . 4.70
Fairfield,Ala. T2 . . . . 3.95
Fontana,Calif. K1 . . . . 4.65
Gary,Ind. U5 . . . . . 3.95
Houston S5 . . . . . 4.35
Ind.Harbor,Ind. I-2, Y1 3.95
Johnstown,Pa. B2 . . . . 3.95
KansasCity,Mo. S5 . . . . 4.55
Lackawanna,N.Y. B2 . . 3.95
LosAngeles B3 . . . . . 4.65
Milton,Pa. B6 . . . . . 4.55
Minnequa,Colo. C10 . . . 4.40
Niles,Calif. P1 . . . . . 4.65
N.Tonawanda,N.Y. B11 3.95
Pittsburg,Calif. C11 . . . 4.65
Pittsburgh J5 . . . . . 3.95
Seattle B3, N14 . . . . . 4.70
So.Chicago R2,U5,W14 . . 3.95
So.Duquesne,Pa. U5 . . . 3.95
So.SanFran.,Cal. B3 . . . 4.70
Sterling,Ill. N15 . . . . . 4.55
Struthers,O. Y1 . . . . . 3.95
Torrance,Calif. C11 . . . 4.65
Weirton,W.Va. W6 . . . . 4.10
Youngstown R2, U5 . . . 3.95

BAR SIZE ANGLES, S. Shapes
Aliquippa,Pa. J5 . . . . . 3.95
Atlanta,A11 . . . . . 4.50
Niles,Calif. P1 . . . . . 4.65
SanFrancisco S7 . . . . . 5.00

BAR SIZE ANGLES, H.R.CARBON
Bethlehem,Pa. B2 . . . . . 4.15

BARS, Hot-Rolled Alloy
Bethlehem,Pa. B2 . . . . 4.675
Buffalo R2 . . . . . 4.675
Canton,O. R2 . . . . . 4.675
Canton,O. T7 . . . . . 4.72
Clairton,Pa. U5 . . . . . 4.675
Detroit R7 . . . . . 4.825
Ecorse,Mich. G5 . . . . . 5.025
Fontana,Calif. K1 . . . . 5.725
Gary,Ind. U5 . . . . . 4.675
Houston S5 . . . . . 5.075
Ind.Harbor,Ind. I-2, Y1 4.675
Johnstown,Pa. B2 . . . . 4.675
KansasCity,Mo. S5 . . . . 5.275
Lackawanna,N.Y. B2 . . 4.675
LosAngeles B3 . . . . . 5.725
Massillon,O. R2 . . . . . 4.675
Midland,Pa. C18 . . . . . 4.30
So.Chicago R2,U5,W14 . . 4.675
So.Duquesne,Pa. U5 . . . 4.675
Struthers,O. Y1 . . . . . 4.675
Warren,O. C17 . . . . . 4.675
Youngstown U5 . . . . . 4.675

BAR SHAPES, Hot-Rolled Alloy
Clairton,Pa. U5 . . . . . 4.925
Gary,Ind. U5 . . . . . 4.925
Youngstown U5 . . . . . 4.925

BARS & SMALL SHAPES, H.R., High-Strength Low-Alloy
Aliquippa,Pa. J5 . . . . . 5.925
Bessemer,Ala. T2 . . . . 5.925
Bethlehem,Pa. B2 . . . . 5.925
Clairton,Pa. U5 . . . . . 5.925
Cleveland R2 . . . . . 5.925
Ecorse,Mich. G5 . . . . . 6.675
Fairfield,Ala. T2 . . . . 5.925
Fontana,Calif. K1 . . . . 6.975
Gary,Ind. U5 . . . . . 5.925
Ind.Harbor,Ind. I-2 . . . 5.925
IndianaHarbor,Ind. Y1 . 6.425
Johnstown,Pa. B2 . . . . 5.925
Lackawanna,N.Y. B2 . . 5.925
LosAngeles B3 . . . . . 6.625
Pittsburgh J5 . . . . . 5.925
Seattle B3 . . . . . 6.675
So.Duquesne,Pa. U5 . . . 5.925
So.SanFrancisco B3 . . . 6.675
Struthers,O. Y1 . . . . . 6.425
Youngstown U5 . . . . . 5.925

BARS, Cold-Finished Carbon
Ambridge,Pa. W18 . . . . 4.925
BeaverFalls,Pa. R2 . . . 4.925
BeaverFalls,Pa. M12 . . . 4.925
Buffalo B5 . . . . . 4.975
Camden,N.J. P13 . . . . . 5.375
Carnegie,Pa. C12 . . . . . 4.925
Chicago B5 . . . . . 4.925
Chicago W18 . . . . . 4.925
Cleveland A7, C20 . . . . 4.925
Detroit P17, R7 . . . . . 5.075
Donora,Pa. A7 . . . . . 4.925
Elyria,O. W8 . . . . . 4.925
FranklinPark,Ill. N5 . . . 4.925
Gary,Ind. R2 . . . . . 4.925
GreenBay,Wis. F7 . . . . 4.925
Hammond,Ind. L2, M13 . . 4.925
Hartford,Conn. R2 . . . . 5.475
LosAngeles R2 . . . . . 6.375
Mansfield,Mass. B5 . . . . 5.475
Massillon,O. R2, R8 . . . 4.925
Monaca,Pa. S17 . . . . . 4.925
Newark,N.J. W18 . . . . . 5.375
Plymouth,Mich. P5 . . . . 5.175
Pittsburgh J5 . . . . . 4.925
Putnam,Conn. W18 . . . . 5.475
Readville,Mass. C14 . . . 5.475
St.Louis,Mo. M5 . . . . . 5.30
So.Chicago,Ill. W14 . . . 4.925
SpringCity,Pa. K3 . . . . 5.375
Struthers,O. Y1 . . . . . 4.925
Waukegan,Ill. A7 . . . . 4.925
Youngstown Y1 . . . . . 4.925
Youngstown F3 . . . . . 4.925

BARS, Cold-Finished Alloy
Ambridge,Pa. W18 . . . . 6.00
BeaverFalls,Pa. M12 . . . 6.00
Bethlehem,Pa. B2 . . . . 6.00
Buffalo B5 . . . . . 6.00
Camden,N.J. P13 . . . . . 6.40
Canton,O. R2 . . . . . 6.00
Canton,O. T7 . . . . . 5.99
Carnegie,Pa. C12 . . . . . 6.00
Chicago B5 . . . . . 6.00
Chicago W18 . . . . . 6.00
Cleveland A7 . . . . . 6.05
Cleveland C20 . . . . . 6.00
Detroit P17, R7 . . . . . 6.15
Donora,Pa. A7 . . . . . 6.05
Elyria,O. W8 . . . . . 6.00
Gary,Ind. R2 . . . . . 6.00
Hammond,Ind. L2, M13 . . 6.00
Hartford,Conn. R2 . . . . 6.45
Lackawanna,N.Y. B2 . . . 6.00
Mansfield,Mass. B5 . . . . 6.45
Massillon,O. R2, R8 . . . 6.00
Midland,Pa. C18 . . . . . 5.40
Monaca,Pa. S17 . . . . . 6.00
Newark,N.J. W18 . . . . . 6.35
Plymouth,Mich. P5 . . . . 6.20
So.Chicago,Ill. R2, W14 . 6.00
SpringCity,Pa. K3 . . . . 6.20
Struthers,O. Y1 . . . . . 6.00
Warren,O. C17 . . . . . 6.00
Waukegan,Ill. A7 . . . . 6.05
Worcester,Mass. A7 . . . . 6.35
Youngstown Y1 . . . . . 6.00
Youngstown F3 . . . . . 6.00

BARS, Reinforcing (Fabricators)
AlabamaCity,Ala. R2 . . . 3.95
Atlanta,A11 . . . . . 4.50
Buffalo R2 . . . . . 3.95
Cleveland R2 . . . . . 3.95
Emeryville,Calif. J7 . . . 4.70
Fairfield,Ala. T2 . . . . 3.95
Fontana,Calif. K1 . . . . 4.65
Gary,Ind. U5 . . . . . 3.95
Houston S5 . . . . . 4.35
Ind.Harbor,Ind. I-2, Y1 3.95
Johnstown,Pa. B2 . . . . 3.95
KansasCity,Mo. S5 . . . . 4.55
Lackawanna,N.Y. B2 . . 3.95
LosAngeles B3 . . . . . 4.65
Milton,Pa. B6 . . . . . 4.55
Minnequa,Colo. C10 . . . 4.75
Niles,Calif. P1 . . . . . 4.65
Pittsburg,Calif. C11 . . . 4.65
Pittsburgh J5 . . . . . 3.95
SandSprings,Okla. S5 . . 4.85
Seattle B3, N14 . . . . . 4.70
So.Chicago,Ill. R2 . . . . 3.95
So.Duquesne,Pa. U5 . . . 3.95
So.SanFrancisco B3 . . . 4.70
SparrowsPoint,Md. B2 . . 3.95
Sterling,Ill.(1) N15 . . . . 4.70
Struthers,O. Y1 . . . . . 3.95
Torrance,Calif. C11 . . . 4.65
Youngstown R2, U5 . . . 3.95

BARS, Reinforcing (Fabricated, to Consumers)
Huntington,W.Va. W7 . . 5.50
Johnstown, ¾-1" B2 . . . 4.75
LosAngeles B3 . . . . . 5.45
Marion,O. P11 . . . . . 5.25
Seattle B3, N14 . . . . . 5.80
So.SanFrancisco B3 . . . 5.45
SparrowsPt., ¾-1" B2 . . 4.75
Williamsport,Pa. S19 . . . 5.10

RAIL STEEL BARS
ChicagoHts.(3,4) C2 . . . 4.75
ChicagoHts.(3,4) I-2 . . . 4.75
Franklin,Pa.(3,4) F5 . . . 4.75
FortWorth,Tex.(26) T4 . . 5.10
Huntngt.W.Va.(3) W7 . . 5.75
Marion,O.(3) P11 . . . . . 4.75
Moline,Ill.(3) R2 . . . . . 4.05
Tonawanda(3,4) B12 . . . 5.00
Williamsport(3) S19 . . . 5.25
Williamsport(4) S19 . . . 5.35

BARS, Wrought Iron
(Add 4.7% to base and extras)
Economy,Pa.(S.R.) B14 . 9.60
Economy,Pa.(D.R.)B14 . 11.90
Economy(Staybolt) B14 . 12.20
McK.Rks.(Staybolt)L5 . . 14.50
McK.Rks.(S.R.) L5 . . . . 9.60
McK.Rks.(D.R.) L5 . . . . 13.00

SHEETS, Hot-Rolled Steel
(18 gage and heavier)
AlabamaCity,Ala. R2 . . 3.775
Ashland,Ky.(8) A10 . . . 3.775
Butler,Pa. A10 . . . . . 3.775
Cleveland J5, R2 . . . . 3.775
Conshohocken,Pa. A3 . . 4.175
Detroit M1 . . . . . 4.40
Ecorse,Mich. G5 . . . . . 3.975
Fairfield,Ala. T2 . . . . 3.775
Fontana,Calif. K1 . . . . 4.725
Gary,Ind. U5 . . . . . 3.775
Geneva,Utah C11 . . . . 3.875
GraniteCity,Ill. G4 . . . 4.30
Ind.Harbor,Ind. I-2, Y1 3.775
Irvin,Pa. U5 . . . . . 3.775
Lackawanna,N.Y. B2 . . 3.775
Munhall,Pa. U5 . . . . . 3.775
Niles,O. N12 . . . . . 5.425
Pittsburg,Calif. C11 . . . 4.475
Pittsburgh J5 . . . . . 3.775
Sharon,Pa. S3 . . . . . 4.175
So.Chicago,Ill. W14 . . . 3.775
SparrowsPoint,Md. B2 . . 3.775
Steubenville,O. W10 . . . 3.775
Torrance,Calif. C11 . . . 4.475
Warren,O. R2 . . . . . 3.775
Weirton,W.Va. W6 . . . . 3.775
WestLeechburg,Pa. A4 . . 3.925
Youngstown U5, Y1 . . . 3.775

SHEETS, H.R. (19 gage)
AlabamaCity,Ala. R2 . . . 4.925
Dover,O. R1 . . . . . 5.825
Mansfield,O. E6 . . . . . 5.65
Niles,O. N12 . . . . . 5.675
Torrance,Calif. C11 . . . 5.575

SHEETS, H.R. (14 ga., heavier)
High-Strength Low-Alloy
Cleveland J5, R2 . . . . 5.675
Conshohocken,Pa. A3 . . 5.925
Ecorse,Mich. G5 . . . . . 6.225
Fairfield,Ala. T2 . . . . 5.675
Fontana,Calif. K1 . . . . 6.625
Gary,Ind. U5 . . . . . 5.675
Ind.Harbor,Ind. I-2 . . . 5.675
Ind.Harbor,Ind. Y1 . . . 6.175
Irvin,Pa. U5 . . . . . 5.675
Lackawanna(35) B2 . . . 5.675
Munhall U5 . . . . . 5.675
Pittsburgh J5 . . . . . 5.675
Sharon,Pa. S3 . . . . . 5.675
So.Chicago,Ill. U5 . . . . 5.675
SparrowsPoint(36) B2 . . 5.675
Warren,O. R2 . . . . . 5.675
Weirton,W.Va. W6 . . . . 6.025
Youngstown U5 . . . . . 5.675
Youngstown Y1 . . . . . 6.175

SHEETS, Cold-Rolled
High-Strength Low-Alloy
Cleveland J5, R2 . . . . 6.925
Ecorse,Mich. G5 . . . . . 7.475
Fontana,Calif. K1 . . . . 7.875
Gary,Ind. U5 . . . . . 6.925
IndianaHarbor,Ind. Y1 . 7.425
IndianaHarbor,Ind. I-2 . 6.925
Irvin,Pa. U5 . . . . . 6.925
Lackawanna(37) B2 . . . 6.925
Pittsburgh J5 . . . . . 6.925
SparrowsPoint(38) B2 . . 6.925
Warren,O. R2 . . . . . 6.925
Weirton,W.Va. W6 . . . . 7.275
Youngstown Y1 . . . . . 7.425

SHEETS, Cold-Rolled Steel (Commercial Quality)

Butler,Pa. A10	4.575
Cleveland J5, R2	4.575
Ecorse,Mich. G5	4.775
Fairfield Ala. T2	4.575
Follansbee,W.Va. F4	5.575
Fontana,Calif. K1	5.525
Gary,Ind. U5	4.575
Granite City,Ill. G4	5.275
Ind Harbor,Ind. I-2,Y1	4.575
Irvin,Pa. U5	4.575
Lackawanna,N.Y. B2	4.575
Middletown,O. A10	4.575
Pittsburg,Calif. C11	5.525
Pittsburgh J5	4.575
SparrowsPoint,Md. B2	4.575
Steubenville,O. W10	4.575
Warren,O. R2	4.575
Weirton,W.Va. W6	5.775
WestLeechburg,Pa. A4	5.4
Youngstown,O. Y1	4.575

SHEETS, Galv'd No. 10 Steel High-Strength Low Alloy

Alabama City,Ala. R2	5.075
Ashland,Ky.(8) A10	5.075
Canton,O. R2	5.075
Delphos,O. N16	5.675
Dover,O. R1	5.775
Fairfield,Ala. T2	5.075
Gary,Ind. U5	5.075
Granite City,Ill. G4	5.50
Ind Harbor,Ind. I-2	5.075
Irvin,Pa. U5	5.075
Kokomo,Ind.(13) C16	5.475
Martins Ferry,O. W10	5.075
Niles,O. N12	6.275
Pittsburg,Calif. C11	5.825
SparrowsPoint,Md. B2	5.075
Steubenville,O. W10	5.075
Torrance,Calif. C11	5.825
Weirton,W.Va. W6	5.075

SHEETS, Galvanized No. 10 High-Strength Low Alloy

Irvin,Pa. U5	7.625
SparrowsPoint(39) B2	7.775

SHEETS, Galvannealed Steel

Canton,O. R2	5.625
Irvin,Pa. U5	5.625
Kokomo,Ind.(13) C16	6.025
Niles,O. N12	6.825

SHEETS, ZINCGRIP Steel No. 10

Butler,Pa. A10	5.325
Middletown,O. A10	5.325

SHEETS, Electro Galvanized

Cleveland R2 (28)	5.925
Niles,O. R2 (28)	5.925
Weirton,W.Va. W6	5.775

SHEETS, Well Casing

Fontana,Calif. K1 (43)	5.10
Torrance,Calif. C11	5.275

BLUED Stock, 29 ga

Yorkville,O. W10	7.00
Follansbee,W.Va. F4	7.10
Follansbee (23) F4	6.425

SHEETS, Enameling Iron

Ashland,Ky.(8) A10	4.925
Cleveland R2	4.925
Gary,Ind. U5	4.925
Granite City,Ill. G4	5.625
Ind Harbor,Ind. I-2	4.925
Irvin,Pa. U5	4.925
Middletown,O. A10	4.925
Youngstown Y1	4.925

BLACK PLATE Base Box

Aliquippa,Pa. J5	$6.25
Fairfield,Ala. T2	6.60
Gary,Ind. U5	6.50
Granite City,Ill. G4	6.70
Ind Harbor,Ind. I-2, Y1	6.50
Irvin,Pa. U5	6.50
Niles,O. R2	6.50
Pittsburg,Calif. C11	7.25
SparrowsPoint,Md. B2	6.60
Warren,O. R2	6.50
Weirton,W.Va. W6	6.50
Yorkville,O. W10	6.50

HOLLOWARE ENAMELING Black Plate (29 gage)

Follansbee,W.Va. F4	8.10
Gary,Ind. U5	8.10
Granite City,Ill. G4	8.30
Ind Harbor,Ind. Y1	8.10
Irvin,Pa. U5	8.10
Yorkville,O. W10	8.35

SHEETS, Culvert

No.	Alley	Cu
Ashland,Ky. A10	5.875	6.125
Canton,O. R2	5.925	6.375
Fairfield,Ala. T2	5.875	6.125
Gary,Ind. U5	5.875	6.125
Ind Harbor,Ind. I-2	5.875	6.125
Irvin,Pa. U5	5.875	6.125
Kokomo,Ind. C16	6.525	
MartinsFy.,O. W10	5.875	
Pittsburg,Cal. C11	6.625	
Sp.Pt.,Md. B2	5.875	
TorranceCal.C11	6.625	

SHEETS, Culvert, No. 16 Pure Iron

Ashland,Ky. A10	6.125
Fairfield,Ala. T2	6.125
MartinsFerry,O. W10	6.125

SHEETS, Hot-Rolled Ingot Iron 18 Gage and Heavier

Ashland,Ky.(8) A10	4.025
Cleveland R2	4.375
Ind Harbor,Ind. I-2	4.025
Warren,O. R2	4.175

SHEETS, Cold-Rolled Ingot Iron

Butler,Pa. A10	5.675
Cleveland R2	5.175
Middletown,O. A10	5.075
Warren,O. R2	5.175

SHEETS, Galvanized Ingot Iron No. 10 flat

Ashland,Ky.(8) A10	5.325
Canton,O. R2	5.825

SHEETS, ZINCGRIP Ingot Iron

Butler,Pa. A10	5.575
Middletown,O. A10	5.575

SHEETS, ALUMINIZED

Butler,Pa. A10	8.425

TINPLATE, American 1.25 lb Coke (Base Box)

	1.25 lb	1.50 lb	1.75 lb
Aliquippa,Pa. J5	$8.70	$8.95	$9.05
Fairfield,Ala. T2	8.80	9.05	
Gary,Ind. U5	8.70	8.95	
Granite City,Ill. G4	9.45	9.70	
Sp.Pt.,Md. B2	8.80	9.05	
Warren,O. R2	8.70		
Weirton,W.Va. W6	8.70	8.95	
Yorkville,O. W10	8.70	8.95	

MANUFACTURING TERNES (Special Coated)

Fairfield,Ala. T2	$7.85
Gary,Ind. U5	7.75
Irvin,Pa. U5	7.75
Yorkville,O. W10	7.75

SHEETS, LT. Coated Ternes, 8 lb

Yorkville,O. W10	$8.65

SHEET, Mfg. Ternes, 8 lb (Commercial Quality)

Gary,Ind. U5	$9.75
Yorkville,O. W10	9.75

SHEET, Long Terne Steel (Commercial Quality)

Beech Bottom,W.Va. W10	5.475
Gary,Ind. U5	5.475
Mansfield,O. E6	6.05
Middletown,O. A10	5.475
Niles,O. N12	6.275
Weirton,W.Va. W6	5.475

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10	5.875

ROOFING SHORT TERNES (8 lb Coated)

Gary,Ind. U5	9.75

STRIP, Hot-Rolled High-Strength Low-Alloy

Bessemer,Ala. T2	5.65
Conshohocken,Pa. A3	5.90
Ecorse,Mich. G5	6.30
Fairfield,Ala. T2	5.65
Fontana,Calif. K1	6.55
Gary,Ind. U5	5.65
Ind Harb.,Ind. I-2	5.65
Ind Harbor,Ind. Y1	6.15
Lackawanna,N.Y. B2	5.70
Los Angeles,Cal. R3	6.40
Seattle(25) B3	6.65
Sharon,Pa. S3	5.65
So. SanFrancisco(25) B3	6.40
SparrowsPoint,Md. B2	5.70
Warren,O. R2	5.65
Weirton,W.Va. W6	6.10
Youngstown Y1	6.15
Youngstown U5	5.65

STRIP, Cold-Rolled High-Strength Low-Alloy

Cleveland J5	7.45
Cleveland A7	7.30
Dover,O. G6	8.00
Ecorse,Mich. G5	8.15
Lackawanna,N.Y. B2	7.90
Sharon,Pa. S3	7.30
SparrowsPoint,Md. B2	7.90
Warren,O. R2	7.30
Weirton,W.Va. W6	7.95
Youngstown Y1	7.80

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2	3.725
Alton,Ill. L2	4.225
Ashland,Ky.(8) A10	3.725
Atlanta A11	4.275
Bessemer,Ala. T2	3.725
Bridgeport,Conn.(10) S15	4.225
Buffalo(27), R2	3.725
Butler,Pa. A10	3.725
Carteret,Pa. S18	4.225
Conshhocken,Pa. A3	4.125
Detroit M1	4.40
Ecorse,Mich. G5	4.025
Fairfield,Ala. T2	3.725
Fontana,Calif. K1	4.975
Gary,Ind. U5	3.725
Houston,Tex. S5	4.125
Ind Harbor,Ind. I-2,Y1	3.725
Johnstown,Pa.(25) B2	3.725
KansasCity,Mo.(9) S5	4.325
Lackawanna,N.Y.(12) B2	3.725
LosAngeles(25) R3	4.475
Milton,Pa. B6	4.35
Minnequa,Colo. C10	4.775
NewBritain(10) S15	4.225
N.Tonawanda,N.Y. B11	3.725
Pittsburg,Calif. C11	4.475
Riverdale,Ill. A7	3.725
SanFrancisco S7	5.00
Seattle(25) B3	4.725
Seattle N14	4.75
Sharon,Pa. S3	4.225
So.Chicago,Ill. W14	3.725
So.SanFrancisco(25) B3	4.475
SparrowsPoint,Md. B2	3.725
Sterling,Ill. N15	4.725
Torrance,Calif. C11	4.475
Warren,O. R2	3.725
Weirton,W.Va. W6	3.825
WestLeechburg,Pa. A4	3.975
Youngstown U5, Y1	3.725

STRIP, Hot-Rolled Alloy

Bridgeprt.Conn.(10) S15	6.05
Carteret,Pa. S18	6.45
Fontana,Calif. K1	7.30
Gary,Ind. U5	6.10
Houston,Tex. S5	6.50
KansasCity,Mo. S5	6.70
Midland,Pa. C18	5.85
NewBritn.Conn.(10) S15	6.05
Sharon,Pa. S3	6.45
Youngstown U5	6.10

STRIP, Cold-Rolled Carbon

Anderson,Ind.(40) G6	5.50
Bridgeprt,Conn.(10) S15	5.80
Butler,Pa. A10	5.10
Cleveland A7, J5	5.10
Dearborn,Mich. D3	6.05
Detroit D2	5.60
Detroit M1	5.45
Dover,O.(40) G6	5.50
Ecorse,Mich. G5	5.90
Follansbee,W.Va. F4	6.10
Fontana,Calif. K1	6.75
FranklinPark,Ill.(40) T6	5.35
Ind Harbor,Ind. I-2	5.35
Lackawanna,N.Y. B2	5.10
LosAngeles C1	6.85
Mattapan,Mass. T6	5.95
Middletown,O. A10	5.10
NewBritain(10) S15	5.80

STRIP, Cold-Finished, Spring Steel (Annealed)

	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Beren,O. C7		7.65	8.25	10.20	12.50
Bridgeport,Conn.(10) S15	5.80	7.65	8.25	10.20	12.50
Bristol,Conn. W1			8.55	10.50	
Carteret,Pa. S18		7.65	8.25	10.20	12.50
Cleveland A7	5.10	7.30	8.25	10.20	12.50
Dearborn,Mich. D3	6.05	7.90	8.50		
Detroit D2	5.45	7.50	8.10		
Dover,O. G6	5.50	7.65	8.25	10.20	12.50
FranklinPark,Ill. T6	5.45	7.45	8.40	10.35	12.65
Harrison,N.J. C18			8.55	10.50	12.80
Mattapan,Mass. T6	5.95	7.60	8.55	10.50	12.80
NewBritn.Conn.(10) S15	5.80	7.65	8.25	10.20	12.50
NewCastle,Pa. B4	5.80	7.65	8.25	10.20	
NewCastle,Pa. E5	5.80	7.65	8.25	10.20	12.50
NewHaven,Conn. D2	6.70	7.60	8.20		
NewYork W3		7.95	8.55	10.50	12.80
Pawtucket,R.I. N8					
Cleveland Butt Base		7.65	8.25	10.20	12.50
Worcester,Mass.,Base	6.30	7.95	8.55	10.50	12.80
Sharon,Pa. S3	5.80	7.65	8.25	10.20	12.50
Trenton,N.J. R5		7.95	8.55	10.50	12.80
Wallingford,Conn. W2	6.30	7.60	8.20	10.15	12.65
Warren,O. T5	6.20	7.65	8.25	10.20	12.50
Weirton,W.Va. W6	5.80	7.65	8.25	10.20	12.50
Worcester,Mass. A7	5.40	7.60	8.55	10.50	12.80
Worcester,Mass. T6	5.95	7.60	8.55	10.50	12.80
Youngstown C8		7.65	8.25	10.20	12.50

Spring Steel (Tempered)

Trenton,N.J. R5 (29)		10.30	12.50	15.35
Harrison,N.J. C18		10.30	12.50	15.35
NewYork W3		10.30*	12.50*	15.35*
Youngstown C8		10.30	12.50	15.35

* Plus $1.575 per 100 lb.

STRIP, Hot-Rolled Alloy

Bridgeprt.Conn.(10) S15	6.05
Carteret,Pa. S18	6.45
Fontana,Calif. K1	7.30
Gary,Ind. U5	6.10
Houston,Tex. S5	6.50
KansasCity,Mo. S5	6.70
Midland,Pa. C18	5.85
NewBritn.Conn.(10) S15	6.05
Sharon,Pa. S3	6.45
Youngstown U5	6.10

STRIP, Cold-Rolled Carbon

Anderson,Ind.(40) G6	5.50
Bridgeprt,Conn.(10) S15	5.80
Butler,Pa. A10	5.10
Cleveland A7, J5	5.10
Dearborn,Mich. D3	6.05
Detroit D2	5.60
Detroit M1	5.45
Dover,O.(40) G6	5.50
Ecorse,Mich. G5	5.90
Follansbee,W.Va. F4	6.10
Fontana,Calif. K1	6.75
FranklinPark,Ill.(40) T6	5.35
Ind Harbor,Ind. I-2	5.35
Lackawanna,N.Y. B2	5.10
LosAngeles C1	6.85
Mattapan,Mass. T6	5.95
Middletown,O. A10	5.10
NewBritain(10) S15	5.80
NewCastle,Pa. B4	5.80
NewCastle,Pa.(40) E5	5.70
NewHaven,Conn. D2	5.85
NewHaven,Conn. A7	5.60
Pawtucket,R.I. R3	6.45
Pawtucket,R.I.(21), N8	6.30
Riverdale,Ill.(40) A1	5.35
Rome,N.Y. R6	5.10
Sharon,Pa. S3	5.80
SparrowsPoint,Md. B2	5.10
Trenton,N.J. R5	6.45
Wallingford,Conn. W2	6.30
Warren,O.(40), T5	5.70
Warren,O. R2	5.10
Weirton,W.Va. W6	5.10
Youngstown C8 (40)	5.70
Youngstown Y1	5.10

STRIP, Electro Galvanized

Dover,O. G6	5.50
Warren,O. T5	5.70
Weirton,W.Va. W6	5.10
Youngstown C8	5.70

STRIP, Cold-Rolled Alloy Steel

Bridgeport,Conn.(10) S15	12.15
Carteret,Pa. S18	12.00
Cleveland A7	11.40
Dover,O. G6	11.90
Fontana,Calif. K1	13.05
Harrison,N.J. C18	12.00
Midland,Pa. C18	12.00
NewBritn.Conn.(10) S15	12.15
Pawtucket,R.I.(11), N8	12.15
Pawtucket,R.I.(12), N8	12.45
Sharon,Pa. S3	12.00
Worcester,Mass. A7	11.70
Youngstown C8	12.00

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10	3.975
Warren,O. R2	4.325

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2	5.20

TIGHT COOPERAGE HOOP

Atlanta A11	4.45
Birmingham,Ill. A1	4.30
Sharon,Pa. S3	4.55
Warren,O. R2	4.15

TINPLATE, Electrolytic (Base Box)

	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$7.40	$7.65	$8.05
Fairfield,Ala. T2	7.50	7.75	8.15
Gary,Ind. U5	7.40	7.65	8.05
Granite City,Ill. G4	7.60	7.85	8.25
IndianaHarbor,Ind. I-2, Y1	7.40	7.65	8.05
Irvin,Pa. U5	7.40	7.65	8.05
Niles,O. R2	7.40		
Pittsburg,Calif. C11	8.15	8.40	8.80
SparrowsPoint,Md. B2	7.50	7.75	8.15
Weirton,W.Va. W6	7.40	7.65	8.05
Yorkville,O. W10	7.40	7.65	8.05

SHEETS, SILICON, H.R. or C.R. COILS (Cut lengths 1/2c lower)

	Armature Field	Electric Motor	Dynamo
BeechBottom,W10 (cut lengths)		7.85 9.10	9.90
Brackenridge,Pa. A4		7.85 9.00	10.40
Granite City,Ill. G4 (cut lengths)		8.55 9.80	
IndianaHarbor,Ind. I-2	7.55 7.85	(34) (41)	
Mansfield,O. E6 (cut lengths)	7.20 7.35	7.85 9.10	9.90
Niles,O. N12 (cut lengths)	7.05 7.35	7.85	
Vandergrift,Pa. U5	7.55 7.85	8.35 9.60	10.40
Warren,O. R2	7.55 7.85	8.35 9.60	10.40
Zanesville,O. A10	7.85	8.35 9.60	10.40

SHEETS, SILICON (22 Ga. Base) COILS (Cut Lengths 1/2c lower)

Transformer Grade	72	65	58	52
BeechBottom,W10 (cut lengths)	10.45	11.00	11.70	12.50
Brackenridge,Pa. A4	10.95			
Vandergrift,Pa. U5	10.95	11.50	12.20	13.00
Warren,O. R2	10.95			
Zanesville,O. A10	10.95	11.50	12.20	13.00

H.R. or C.R. COILS AND CUT LENGTHS, SILICON (22 Ga.)

	T-100	T-90	T-80	T-73
Butler,Pa. A10 (C.R.)			15.35	15.85
Vandergrift,Pa. U5	13.50	14.35	15.35	15.85

Key to Producers

A1 Acme Steel Co.	C10 Colorado Fuel & Iron	G2 Globe Iron Co.	
A3 Allan Wood Steel Co.	C11 Columbia Geneva Steel	G3 Globe Steel Tubes Co.	
A4 Allegheny Ludlum Steel	C12 Columbia Steel & Shaft	G4 Granite City Steel Co.	
A7 American Steel & Wire	C13 Columbia Tool Steel Co.	G5 Great Lakes Steel Corp.	
A8 Anchor Drawn Steel Co.	C14 Compressed Steel Shaft	G6 Greer Steel Co.	
A9 Angel Nail & Chaplet	C16 Continental Steel Corp.	H1 Hanna Furnace Corp.	
A10 Armco Steel Corp.	C17 Copperweld Steel Co.	I-1 Ipse Bros. Inc.	
A11 Atlantic Steel Co.	C18 Crucible Steel Co.	I-2 Inland Steel Co.	
A13 American Cladmetals Co.	C19 Cumberland Steel Co.	I-3 Interlake Iron Corp.	
B1 Babcock & Wilcox Co.	C20 Cuyahoga Steel & Wire	I-4 Ingersoll Steel Div. Borg-Warner Corp.	
B2 Bethlehem Steel Co.	C22 Claymont Steel Corp.	I-7 Indiana Steel & Wire Co.	
B3 Beth. Pac. Coast Steel	D2 Detroit Steel Corp.	J1 Jackson Iron & Steel Co.	
B4 Blair Strip Steel Co.	D3 Detroit Tube & Steel	J3 Je sop Steel Co.	
B5 Bliss & Laughlin Inc.	D4 Disston & Sons, Henry	J4 Johnson Steel & Wire Co.	
B6 Bolardi Steel Corp.	D6 Driver Harris Co.	J5 Jones & Laughlin Steel	
B8 Braeburn Alloy Steel	D7 Jackson Weatherproof Nail Co.	J6 Joslyn Mfg. & Supply	
B11 Buffalo Bolt Co.	E1 Eastern Gas&Fuel Assoc.	J7 Judson Steel Corp.	
B12 Buffalo Steel Div., H.K. Porter Co.	E2 Eastern Stainless Steel	J8 Jersey Shore Steel Co.	
B14 A. M. Byers Co.	E4 Electro Metallurgical Co.	K1 Kaiser Steel Corp.	
C1 Calstrip Steel Corp.	E5 Elliott Bros. Steel Co.	K2 Keokuk Electro Metals	
C2 Calumet Steel Div. Borg-Warner Corp.	E6 Empire Steel Corp.	K3 Keystone Drawn Steel	
C4 Carpenter Steel Co.	F2 Firth Sterling Inc.	K4 Keystone Steel & Wire	
C5 Central Iron & Steel Div. Barium Steel Corp.	F3 Fitzsimons Steel Co.	L1 Laclede Steel Co.	
C7 Cleve. Cold Rolling Mills	F4 Follansbee Steel Corp.	L2 LaSalle Steel Co.	
C8 Cold Metal Products Co.	F5 Franklin Steel Div. Borg-Warner Corp.	L3 Latrobe Steel Co.	
C9 Colonial Steel Co.	F6 Fretz-Moon Tube Co.	L5 Lockhart Iron & Steel	
	F7 Ft. Howard Steel & Wire	L6 Lone Star Steel Co.	
		L7 Lukens Steel Co.	

WIRE, Merchant Quality

(6 to 8 gage)	Ann'l.	Galv.
AlabamaCity R2	6.075	6.325
Aliquippa J5	6.075	6.45*
Atlanta A11	6.325	6.675
Bartonville(19) K4	6.075	6.40
Buffalo W12	6.225	
Cleveland A7	6.075	6.225
Crawfordsville Ms	6.175	6.55
Donora,Pa. A7	6.075	6.225
Duluth,Minn. A7	6.075	6.225
Fairfield T2	6.075	6.225
Houston,Tex. S5	6.475	6.625
Johnstown B2	6.075	6.45†
Joliet,Ill. A7	6.075	6.225
KansasCy Mo. S5	6.675	6.825
Kokomo C16	6.175	6.425
LosAngeles B3	7.025	
Minnequa C10	6.325	6.70*
Monessen P7	6.075	6.45
Palmer W12	6.325	
Pitts.,Calif. C11	7.025	7.175
Prtsmth (18) P12	6.475	
Rankin A7	6.075	6.225
So.Chicago R2	6.075	6.325
So.S.Fran. C10	7.025	7.40*
SparrowsPt, B2	6.175	6.55†
Sterling,Ill (1) N15	6.075	6.40
Struthers,O. Y1	6.075	6.475
Torrance,Cal. C11	7.025	
Worcester A7	6.375	6.525

*Based on 14-cent zinc; †14.50-cent zinc.

ROPE WIRE

Alton,Ill. L1	9.15
Bartonville,Ill. K4	8.95
Buffalo W12 (43)	8.55
Fostoria,O. S1 (43)	8.85
Johnstown,Pa. B2 (43)	8.55
Monessen,Pa. P16 (43)	8.55
Monessen,Pa. P7 (43)	8.80
Muncie,Ind. I-7 (43)	8.80
Palmer,Mass. W12 (43)	8.85
Portsmouth,O. P12 (43)	8.55
Roebling,N.J. R5 (43)	8.85
SparrowsPt, B2 (43)	8.65
Struthers,O. Y1 (43)	8.55
Worcester J4, T6 (43)	8.85

(A) Plow and Mild Plow; add 0.25c for improved plow.

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2	5.225
Aliquippa,Pa. J5 (42)	4.85
Atlanta A11	5.475
Alton,Ill. L1	5.45
Bartonville,Ill. K4	5.325
Buffalo W12	5.225
Chicago W13	5.475
Cleveland A7, C20	5.225
Crawfordsville,Ind. MS	5.325
Donora,Pa. A7	5.225
Duluth,Minn. A7	5.225
Fairfield,Ala. T2	5.225
Fostoria,O (24) S1	5.725
Houston S5	5.625
Johnstown,Pa. B2	5.225
Joliet,Ill. A7	5.225
KansasCity,Mo. S5	5.525
Kokomo,Ind. C16	5.325
LosAngeles B3	6.175
Minnequa,Colo. C10	5.475
Monessen,Pa. P7	5.475
Newark 6-8 ga. I-1	5.88
No.Tonawanda W11	5.225
Palmer,Mass. W12	5.325
Pittsburg,Calif. C11	6.175
Portsmouth,O. P12	5.625
Rankin,Pa. A7	5.225
So.Chicago,Ill. R2	5.225
So.SanFrancisco C10	6.175
SparrowsPoint,Md. B2	5.325
Sterling,Ill (1) N15	5.225
Struthers,O. Y1	5.225
Torrance,Calif. C11	7.025
Waukegan,Ill. A7	5.225
Worcester,Mass. A7	5.525

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	6.20
Buffalo W12 (43)	5.85
Cleveland A7 (43)	5.85
Crawfordsville,Ind. MS(43)	5.85
Dover,O. G6	6.20
Fostoria,O. S1 (43)	6.00
Kokomo,Ind. C16 (43)	5.70
Franklin Park,Ill. T6(43)	6.20
Massillon,O. R5 (43)	5.85
Monessen,Pa. P16 (43)	6.35
Monessen,Pa. P7 (43)	6.10
Pawtkt.R.I.(12) N8 (43)	6.85
Trenton,N.J. R5 (43)	6.15
Worcester,Mass. A7(43)	6.15
Worcester,Mass. T6(43)	6.50
Worcester,Mass W12(43)	6.65

WIRE, Galv'd ACSR for Cores

Bartonville,Ill. K4	8.90
Monessen,Pa. P16 (43)	8.50
Muncie,Ind. I-7 (43)	8.70
Roebling,N.J. R5 (43)	8.80
SparrowsPt, Md. B2(43)	8.60
Johnstown,Pa. B2 (43)	8.50

WIRE (16 gage)	Ann'l. Galv. Stone	Galv. Stone
(Add 4.75 on base and extras)		
Aliquippa J5	10.15	12.15
Bartonville(19) K4	10.25	12.00*
Cleveland A7	10.25	11.55
Crawfordsville,Ind. MS	10.25	12.00
Fostoria,O. S1	10.40	13.00
Johnstown B2	10.73	12.58†
Kokomo C16	10.625†	12.325†
Minnequa C10	10.40	12.425*
Palmer,Mass. W12	10.25	12.15
Pitts.,Cal. C11	10.60	11.90
SparrowsPt, B2	10.84	12.68†
Waukegan A7	10.25	11.55
Worcester A7	11.85	

*Based on 14-cent; $14.50 cent zinc, †Includes 4.7% increase.

WIRE, MB Spring, High Carbon

Aliquippa,Pa. J5 (43)	6.25
Alton,Ill. L1	6.85
Bartonville,Ill. K4	6.64
Buffalo W12 (43)	6.25
Cleveland A7 (43)	6.25
Donora,Pa. A7 (43)	6.25
Duluth,Minn. A7 (43)	6.25
Fostoria,O. S1 (43)	6.25
Johnstown,Pa. B2 (43)	6.25
Millbury(12), N6 (43)	8.05
Minnequa,Colo. C10(43)	6.50
Monessen,Pa. P7 (43)	6.25
Monessen,Pa. P16	6.75
Muncie,Ind. I-7 (43)	6.45
Palmer,Mass. W12 (43)	6.55
Pitts-burg,Calif. C11(43)	7.20
Roebling,N.J. R5 (43)	6.55
Portsmouth,O. P12(43)	6.25
So.Chicago,Ill. R2 (43)	6.25
So.SanFran. C10 (43)	7.20
SparrowsPt,Md. B2 (43)	6.35
Struthers,O. Y1 (43)	6.25
Trenton,N.J. A7 (43)	6.55
Waukegan,Ill. A7 (43)	6.25
Worcester A7, T6 (43)	6.55
Worcester,Mass. W12(43)	6.55
Worcester,Mass. J4 (43)	6.75

WIRE, Tire Bead

Bartonville,Ill. K4	11.51
Monessen,Pa. P16 (42)	11.40
Roebling,N.J. R5 (43)	11.55

WIRE, Fine & Weaving (8" Coils)

Bartonville,Ill. K4	9.42
Buffalo W12 (43)	8.90
Chicago W13	9.32
Cleveland A7 (43)	8.90
Crawfordsville,Ind. MS(43)	8.90
Fostoria,O. S1 (43)	8.90
Johnstown,Pa. B2 (43)	8.90
Kokomo,Ind. C16 (43)	8.90
Monessen,Pa. P16 (43)	8.90
Muncie,Ind. I-7 (43)	9.10
Palmer,Mass. W12 (43)	9.20
Roebling,N.J. R5 (43)	9.20
Waukegan,Ill. A7 (43)	8.90
Worestr,Mass. A7,T6(43)	9.20

WIRE, Barbed

	Col.
AlabamaCity,Ala. R2	144
Aliquippa,Pa. J5	147*
Atlanta A11	149
Bartonville,Ill (19) K4	146
Crawfordsville,Ind. Ms	149
Donora,Pa. A7	142
Duluth,Minn. A7	142
Fairfield,Ala. T2	142
Houston,Tex. S5	150
Johnstown,Pa. B2	147
Joliet,Ill. A7	142
KansasCity,Mo. S5	154
Kokomo,Ind. C16	149
Minnequa,Colo. C10	153*
Monessen,Pa. P7	147
Pittsburg,Calif. C11	162
Rankin,Pa. A7	142
So.Chicago,Ill. R2	144
So.SanFran.,Calif. C10	167*
SparrowsPoint,Md. B2	149
Sterling,Ill.(1) N15	146

*Based on 14-cent zinc.

WIRE, Upholstery Spring

Aliquippa,Pa. J5	6.275
Alton,Ill. L1	6.50
Buffalo W12	6.275
Cleveland A7	6.275
Donora,Pa. A7	6.275
Duluth,Minn. A7	6.275
Johnstown,Pa. B2	6.275
Los Angeles B3	7.225
Minnequa,Colo. C10	6.525
Monessen,Pa. P7	6.275
Monessen,Pa. P16(42)	6.40
NewHaven,Conn. A7	6.575
Palmer,Mass. W12	6.575
Pittsburg,Calif. C11	7.225
Portsmouth,O. P12	6.275
Roebling,N.J. R5	6.575
So.Chicago,Ill. R2	6.275
So.SanFrancisco C10	7.225
SparrowsPoint,Md. B2	6.375
Torrance,Calif. C11	7.225
Trenton,N.J. A7	6.575
Waukegan,Ill. A7	6.275
Worcester,Mass. A7	6.575

WOVEN FENCE,9-15½ Ga.

	Col.
AlabamaCity,Ala. R2	135
Ala.City,Ala.,17-18ga.R2	222
Aliquippa,Pa.9-14½ga.J5	131
Atlanta A11	140
Bartonville,Ill (19) K4	137
Crawfordsville,Ind. MS	140
Donora,Pa. A7	133
Duluth,Minn. A7	133
Fairfield,Ala. T2	133
Houston,Tex. S5	141
Johnstown,Pa. B2	138
Johnstown,17ga.,6" B2	229
Joliet,Ill. A7	133
KansasCity,Mo. S5	145
Kokomo,Ind. C16	140
Minnequa,Colo. C10	146*
Monessen,Pa. P7	138
Pittsburg,Calif. C11	156
Rankin,Pa. A7	133
So.Chicago,Ill. R2	135
Sterling,Ill.(1) N15	137

*Based on 14-cent zinc.

BALE TIES, Single Loop

	Col.
AlabamaCity,Ala. R2	132
Atlanta A11	135
Bartonville,Ill (19) K4	132
Crawfordsville,Ind. MS	134
Donora,Pa. A7	132
Duluth,Minn. A7	132
Fairfield,Ala. T2	132
Joliet,Ill. A7	132
KansasCity,Mo. S5	144
Kokomo,Ind. C16	134
Minnequa,Colo. C10	137
Pittsburg,Calif. C11	156
So.Chicago,Ill. R2	132
So.SanFran.,Calif. C10	156
SparrowsPoint,Md. B2	134
Sterling,Ill.(1) N15	132

FENCE POSTS

ChicagoHts.,Ill. C2	140
Duluth,Minn. A7	133
Franklin,Pa. F5	140
Huntington,W.Va. W7	148
Johnstown,Pa. B2	148
Marion,O. P11	140
Minnequa,Colo. C10	138
Moline,Ill. R2	136
So.Chicago,Ill. R2	140
Tonawanda,N.Y. B12	148
Williamsport,Pa. S19	138

TRACK BOLTS (20) Treated

KansasCity,Mo. S5	9.85
Lebanon,Pa.(31) B2	9.85
Minnequa,Colo. C10	9.85
Pittsburgh O3, P14	9.85

AXLES

Ind.Harbor,Ind. S13	5.65
Johnstown,Pa. B2	5.65

NAILS, Stock

To dealers & mfrs. (7)	Col.
AlabamaCity,Ala. R2 (44)	118
Aliquippa,Pa. J5 (44)	118
Atlanta A11	130
Bartonville,Ill.(19) K4	127
Chicago,Ill. W13 (44)	118
Cleveland A9 (44)	125
Crawfordsville,Ind. MS	130
Donora,Pa. A7 (44)	118
Duluth,Minn. A7 (44)	118
Fairfield,Ala. T2 (44)	118
Galveston,Tex. D7(44)	126
Houston,Tex. S5 (44)	126
Johnstown,Pa. B2 (44)	118
Joliet,Ill. A7 (44)	118
KansasCity,Mo. S5 (44)	130
Kokomo,Ind. C16	125
Minnequa,Colo. C10 (44)	123
Monessen,Pa. P7	127
Pittsburg,Calif. C11 (44)	137
So.Chicago,Ill. R2	118
Portsmouth,O. P12	132
Rankin,Pa. A7 (44)	118
So.Chicago,Ill. R2 (44)	118
SparrowsPoint,Md B2(44)	120
Sterling,Ill.(1) N15 (44)	118
Torrance,Calif. C11 (44)	138
Worcester,Mass. A7 (44)	124

NAILS, Cut (100 lb keg)

To dealers (33)	
Conshohocken,Pa. A3	$7.80
Wheeling,W.Va. W10	7.80

TIE PLATES

Fairfield,Ala. T2	4.775
Gary,Ind. U5	4.775
Ind.Harbor,Ind. I-2	4.775
Lackawanna,N.Y. B2	4.775
Minnequa,Colo. C10	$95.00*
Pittsburg,Calif. C11	4.925
Seattle B3	4.925
Steelton,Pa. B2	4.775
Torrance,Calif. C11	4.925

*Per net ton.

JOINT BARS

Bessemer,Pa. U5	4.925
Fairfield,Ala. T2	4.925
Ind.Harbor,Ind. I-2	4.925
Lackawanna,N.Y. B2	4.925
Minnequa,Colo. C10	4.925
Steelton,Pa. B2	4.925

STANDARD TRACK SPIKES

Ind.Harbor,Ind. I-2, Y1	6.65
KansasCity,Mo. S5	6.90
Lebanon,Pa. B2	6.65
Minnequa,Colo. C10	6.65
Pittsburgh J5	6.65
Seattle B3	7.15
So.Chicago,Ill. R2	6.65
Steelton,Pa. B2	6.65
Youngstown R2	6.65

RAILS

	Std. No. 1	Std. No. 2	All No. 2	Std. Toe Rails 60 lb Under
Bessemer,Pa. U5	3.775	3.675	3.725	4.25
Ensley,Ala. T2	3.775	3.675		4.25
Fairfield,Ala. T2				4.25
Gary,Ind. U5	3.775	3.675	3.725	
Huntington,W.Va. W7				5.25
IndianaHarbor,Ind. I-2	3.775	3.675	3.725	
Johnstown,Pa. B2				(16)4.25
Lackawanna,N.Y. B2	3.775	3.675		4.25
Minnequa,Colo. C10	$75.50*	$73.50*		4.75
Steelton,Pa. B2	3.775	3.675		
Williamsport,Pa. S19				5.00

* Per net ton.

Key to Producers

M1 McLouth Steel Corp.	
M4 Mahoning Valley Steel	
M5 Medart Co.	
M6 Mercer Tube & Mfg. Co.	
M8 Mid-States Steel & Wire	
M9 Midvale Co.	
M12 Moltrup Steel Products	
M13 Monarch Steel Co.	
M14 McInnes Steel Co.	
N2 National Supply Co.	
N3 National Tube Div.	
N5 Nelsen Steel & Wire Co.	
N6 NewEng-HighCarb.Wire	
N8 Newman-Crosby Steel	
N12 Niles Rolling Mill Div.	
N14 Northwest. Steel Roll. Mills	
N15 Northwestern S.&W. Co.	
N16 New Delphos Mfg. Co.	
O3 Oliver Iron & Steel Corp.	
O4 Oregon Steel Mills	
P1 Pacific States Steel Corp.	
P2 Pacific Tube Co.	
P4 Phoenix Iron & Steel Co.	
P5 Pilgrim Drawn Steel	
P6 Pittsburgh Coke & Chem.	
P7 Pittsburgh Steel Co.	
P9 Pittsburgh Tube Co.	
P11 Pollak Steel Co.	
P12 Portsmouth Division, Detroit Steel Corp.	
P13 Precision Drawn Steel	
P14 Pitts. Screw & Bolt Co.	
P15 Pittsburgh Metallurgical	
P16 Page Steel & Wire Div., Amer. Chain & Cable	
P17 Plymouth Steel Co.	
R1 Reeves Steel & Mfg. Co.	
R2 Republic Steel Corp.	
R3 Rhode Island Steel Corp.	
R5 Roebling's Sons, John A.	
R6 Rome Strip Steel Co.	
R7 Rotary Electric Steel Co.	
R8 Reliance Div., Eaton Mfg. Co.	
S1 Seneca Wire & Mfg. Co.	
S3 Sharon Steel Corp.	
S5 Sheffield Steel Corp.	
S6 Shenango Furnace Co.	
S7 Simmons Co.	
S8 Simonds Saw & Steel Co.	
S9 Sivyo-Sheffield S.&I. Co.	
S13 Standard Forging Corp.	
S14 Standard Tube Co.	
S15 Stanley Works	
S16 Struthers Iron & Steel	
S17 Superior Drawn Steel Co.	
S18 Superior Steel Corp.	
S19 Sweet's Steel Co.	
S20 Southern States Steel	
S24 Seidelhuber Steel	
T2 Tenn. Coal & Iron Div.	
T3 Tenn. Prod. & Chem.	
T4 Texas Steel Co.	
T5 Thomas Strip Division, Pittsburgh Steel Co.	
T6 Thompson Wire Co.	
T7 Timken Roller Bearing	
T9 Tonawanda Iron Div., Am. Rad. & Stan. San.	
U4 Universal Cyclops Steel	
U5 United States Steel Co.	
V2 Vanadium-Alloys Steel	
V3 Vulcan Crucible Steel Co.	
W1 Wallace Barnes Co.	
W2 Wallingford Steel Co.	
W3 Washburn Wire Co.	
W4 Washington Steel Corp.	
W6 Weirton Steel Co.	
W7 W. Va. Steel & Mfg. Co.	
W8 West.Automatic Mach.Screw	
W9 Wheatland Tube Co.	
W10 Wheeling Steel Corp.	
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron	
W13 Wilson Steel & Wire Co.	
W14 Wisconsin Steel Div. International Harvester	
W15 Woodward Iron Co.	
W18 Wyckoff Steel Co.	
Y1 Youngstown Sheet & Tube	

TOOL STEEL

(Prices subject to 4.7% increase)

Grade	$ per lb
Regular Carbon	0.230
Extra Carbon	0.270
Special Carbon	0.325
Oil Hardening	0.350
5% Cr. Hot Work	0.550
Hi-Carbon-Cr.	0.635

Grade by Analysis

W	Cr	V	Co	
18	4	1	....	1.505
18	4	2	....	1.65-1.66
20	25	4	25	1.6 12.25 3.535-3.675
19	4	2	7	2.460
18	25	4	25	1 4.75 2.125
18	4	2	9	2.445-2.45
13.5	4	3	....	1.6025
9	3	25	0.5	1.01

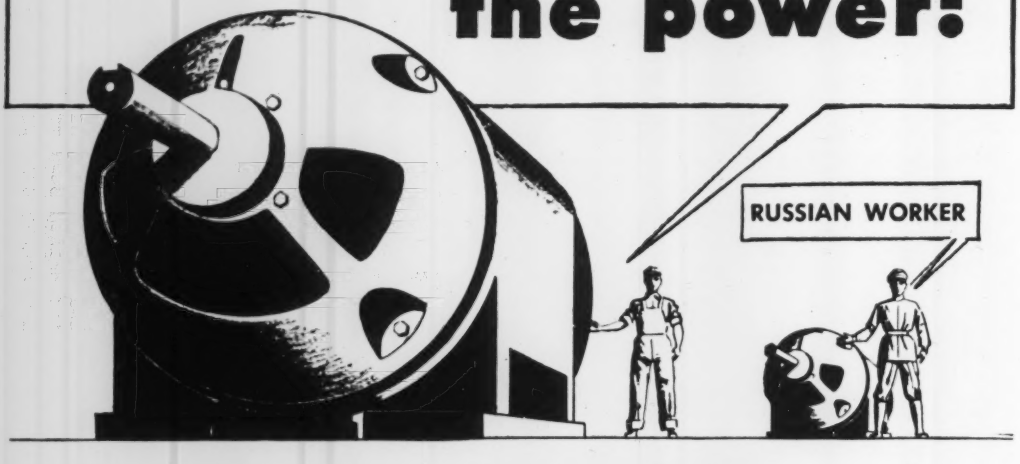
W	Cr	V	Mo	
6.4	4.5	1.9	5	0.96-0.965
6	4	3	6	1.190
1.5	4	1	8.5	0.810

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, D4, F2, J3, L3, M14, S8, U4, V2 and V3.

Footnotes

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(6) Chicago or Birm. base.
(7) To jobbers, 3 cols. lower.
(8) 16 gage and heavier.
(9) 6 in. and narrower.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass. base.
(13) Add 0.50c for 17 Ga. & heavier.
(15) ½" and thinner.
(16) 40 lb and under.
(17) Plate only.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) 0.25c off for untreated.
(21) New Haven, Conn., base.
(22) Del. San Francisco Bay area.
(23) 20 Ga. 36" wide.
(24) Deduct 0.20c, finer than 15 Ga.
(25) Bar mill bands.
(26) Reinforcing, mill lengths, to fabricators; to contractors, 5.85c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Add $11.50 per ton.
(30) Sheared, add 0.35c for universal mill.
(31) Not annealed.
(32) Rd. or square edge.
(33) To jobbers, deduct 20c.
(34) 7.85c for cut lengths.
(35) 12" and narrower.
(36) 24" and narrower.
(37) 15 gage & lighter; 60" & narrower.
(38) 14 gage & lighter; 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.025", 0.055" and heavier 0.25c higher.
(41) 9.10c for cut lengths.
(42) Plus 0.375c per 100 lb.
(43) Plus 4.7% on base and extras.
(44) Plus 45c per 100 lb.
(45) Plus 40c per 100 lb.

AMERICAN WORKERS HAVE 7 times the power!



How does America do it?

Why does the American worker have the help of about 7 times as many kilowatt-hours of electric power as is available to the Russian worker?

How can we Americans produce over 40% of the world's goods and bring so much more of everything to everybody with less than 6% of the world's population? Why is the American output per-man-hour still growing faster and faster?

The answers cannot be laughed off nor are they hard to find. In the words of Ralph J. Cordiner, president of the General Electric Company: "The greatest impetus for forward movement still comes when individuals are free to plan and carry out their own ideas without government coercion or unnecessary regulation."

Including estimated expenditures in 1952, private industry in the last seven years will have invested over 150 billion dollars in new plant and equipment. This contrasts with Federal Government investment of not much more than 12 billion for similar purposes in the same period. Moreover most such Government expenses during the last three years have been allocated to military and atomic projects.

Back of all this progress in private industry is the unique American system of competition—our kind of competition that continually stimulates Americans to make things better and to sell them better—and at lower prices.

In America we do not just compete for public office; we also compete in technology, competency of management, individual initiative and distribution—the latter including selling and advertising in all their varied forms.

Our kind of competition promotes the growth of more and more businesses and industries—and this means more jobs and expanding prosperity from which we all benefit.

"Planned economies" and other fancy theories are not for us. The American competitive system has given us the highest standard of living in the world. Let's all work to preserve it.

This report on PROGRESS-FOR-PEOPLE is published by this magazine in cooperation with National Business Publications, Inc., as a public service. This material, including illustrations, may be used, with or without credit, in plant city advertisements, employee publications, house organs, speeches, or in any other manner.

THE COMPETITIVE SYSTEM DELIVERS THE MOST TO THE GREATEST NUMBER OF PEOPLE

BUTTWELD STANDARD PIPE, T & C

Carload discounts from list, %

Size—Inches	⅛		¼		⅜		½		¾		1		1¼		1½		2		2½		3	
List Per Ft	8.5c		11.5c		17c		23c		27.5c		37c		58.5c		76.5c							
Pounds Per Ft	0.85		1.13		1.68		2.28		2.73		3.68		5.82		7.62							
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Alton, Ill. L1	29.5	10.5	32.5	14.5	35	18	35.5	18.5	36	19.5	36.5	20	37	20.5	37	20.5						
Benwood, W. Va. W10	32.5	13.25	35.5	17.25	38	20.75	38.5	20.5	39	21.5	39.5	22	40	21.75	40	21.75						
Etna, Pa. N2 (1)	32.5	13.25	35.5	17.25	38	20.75	38.5	20.5	39	22.25	39.5	22	40	21.75	40	21.75						
Fontana, Calif. K1 (1)	21	1.75	24	5.75	26.5	9.25	27	9	27.5	10	28	10.5	28.5	10.25	28.5	10.25						
Ind. Harbor, Ind. Y1 (1)	31.5	12.25	34.5	16.25	37	19.75	37.5	19.5	38	20.5	38.5	21	39	20.75	39	20.75						
Lorain, O. N3 (1)	32.5	15.25	35.5	19.25	38	22.75	38.5	22.00	39	23.00	39.5	23.50	40	22.75	40	22.75						
Pittsburgh, J5	30.75	...	33.75	...	36.25	...	36.75	...	37.25	...	37.75	...	41.5	...	41.5	...						
Sharon, Pa. M6	32.5	13.25	35.5	17.25	38	20.25	38.5	19.75	39	20.25	39.5	20.75	40	20.25	40	20.25						
Sparrows Pt. Md. B2	30.5	11.25	33.5	15.25	36	18.75	36.5	18.5	37	19.5	37.5	20	38	19.75	38	19.75						
Youngstown R2 (1)	32.5	15.25	35.5	19.25	38	22.75	38.5	22.00	39	23.00	39.5	23.50	40	22.75	40	22.75						
Youngstown Y1 (1)	32.5	15.25	35.5	19.25	38	22.75	38.5	22.00	39	23.00	39.5	23.50	40	22.75	40	22.75						
Wheatland, Pa. W9	32.5	13.25	35.5	16.25	38	18.75	38.5	19	39	19.5	39.5	20	40	20.25	40	20.25						

SEAMLESS STANDARD PIPE, T & C

Carload discounts from list, %

Size-Inches	2		2½		3		3½		4		5		6	
List Per Ft.	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv
Aliquippa, Pa. J5	24	6	27	8.25	27	8.25	29	10.25	29	10.25	33.75	15	33.75	15
Ambridge, Pa. N2	24	6	27	8.25	27	8.25	29	10.25	29	10.25	33.75	15	33.75	15
Lorain, O. N3 (1)	24	7.50	27	9.25	27	9.25	29	11.25	29	11.25	33.75	16	33.75	16
Youngstown Y1 (1)	24	7.50	27	9.25	27	9.25	29	11.25	29	11.25	33.75	16	33.75	16

ELECTRIC WELD STANDARD PIPE, T & C

Youngstown R2 (1)	24	7.50	27	9.25	27	9.25	29	11.25	29	11.25	33.75	16	33.75	16

BUTTWELD STANDARD PIPE, T & C

Carload discounts from list, %

Size—Inches	⅛		¼		⅜		½		¾		1	
List Per Ft	5.5c		6c		6c		92c		$1.09			
Pounds Per Ft	0.24		0.42		0.57		9.20		10.89			
	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv	Blk	Galv		
Benwood, W. Va. W10	29.5	+0.25	23.25	+3.5	17.75	+7.75	33	14.25	33	14.25		
Butler, Pa. F6 (1)	30.5	1.25	25	+1.75	20	+5.5	...	...	...	...		
Etna, Pa. N2 (1)	30.5	1.25	25	+1.75	20	+5.5	33	14.25	33	14.25		
Sharon, Pa. M6 (1)	29.5	+0.25	23	+4.25	18	+8.25	...	...	...	...		
Sparrows Pt. Md. B2	28.5	+0.75	23	+3.75	18	+7.50	...	...	...	...		
Youngstown R2 (1)	...	...	...	...	...	...	33	15.25	33	15.25		
Wheatland, Pa. W9	28.5	+0.75	23	+3.75	18	+7.50	...	...	...	...		

Galvanized pipe discounts based on zinc price of: (1), 14c; (1), 12.50c; (1), 14.50c.

CLAD STEELS

(Cents per pound; add 4.7% to base price and extras)

	Plates		Sheets		
Cladding	Carbon Base		Carbon Base		Copper Base
Stainless	10%	20%	10%	20%	Both Sides
302	19.75	26.24-27.50			77.00
304	25.00	29.50	24.50	27.50-27.77	77.00
309	30.50	35.00			
310	36.50	41.00			144.00
316	29.50	34.00	26.00	35.92-36.50	
317	34.50	39.00			
318	33.00	38.00			
321	26.50	31.00-32.00	23.00	33.00	111.00
347	27.50	32.00	24.00	33.50-33.83	130.00
405	21.25	27.75			
410	20.75	27.25			
Nickel	33.50	45.15			
Inconel	41.23	54.18			165.00
Monel	34.93	46.28			
Copper*			44.00		

	Strip		
	Carbon Base		
	Cold-Rolled		Hot-Rolled
	10%	Both Sides	10%	Both Sides
Nickel	41.00	54.00		
Copper*	23.70	26.65	20.20	26.40

* Deoxidized. Production points for carbon base products: Stainless plates, sheet: Conshohocken, Pa. A3 and New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7 and Washington, Pa. J3; nickel, Inconel, monel-clad plates: Coatesville L7, nickel, copper-clad strip, Carnegie, Pa. S18. Production point for copper-base sheets is Carnegie, Pa. A13.

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS

(F.o.b. midwestern plants; per cent off list for less than case lots to consumers)

6 in. and shorter:

½-in. & smaller diam.	15
⅝-in. & ¾-in.	13.5
⅞-in. and larger	17.5
Longer than 6 in.:	
All diams.	14
Lag bolts, all diams.:	
6 in. and shorter	23
over 6 in. long	21
Ribbed Necked Carriage	18.5
Blank	34
Plow	34
Step, Elevator, Tap and Sleigh Shoe	21
Tire bolts	21
Boiler & Fitting-Up Bolts	31

NUTS

	Reg. Hvy.
H.P. & C.P. Square:	
½-in. & smaller	15 15
⅝-in. & ¾-in.	12 6.5
⅞-in.-1 1/8-in.	9 1
1⅛-in. & larger	7.5 1
H.P. Hex.:	
½-in. & smaller	26 22
⅝-in. & ¾-in.	16.5 6.5
⅞-in.-1 1/8-in.	12 2
1⅛-in. & larger	8.5 2
C.P. Hex.:	
½-in. & smaller	26 22
⅝-in. & ¾-in.	23 17.5
⅞-in. & 1⅛-in.	19.5 12
1⅛-in. & larger	12 6.5

SEMIFINISHED NUTS

American Standard

(Per cent off list for less than case or keg quantities)

	Reg. Hvy.
½-in. & smaller	35 28.5
⅝-in. & ¾-in.	29.5 22
⅞-in.-1 1/8-in.	24 15
1⅛-in. & larger	13 8.5
	Light
⅛-in. & smaller	35
⅜-in. to ⅝-in.	28.5
¾-in. to 1½-in.	26

SQUARE HEAD SET SCREWS

(Packaged; per cent off list)

1 in. diam x 6 in. and shorter	38
1 in. and smaller diam. x over 6 in.	26

HEADLESS SET SCREWS

(Packaged; per cent off list)

No. 10 and smaller	35
¼-in. diam. & larger	16
N.F. thread, all diams.	10

STEEL STOVE BOLTS

(F.o.b. plant, per cent off list in packages)

Plain finish	48 & 10
Plated finishes	31 & 10

HEXAGON CAP SCREWS

(1020 steel; packaged; per cent off list)

6 in. or shorter:

⅝-in. & smaller	42
⅞-in. through 1 in.	34
Longer than 6 in.:	
⅝-in. & smaller	26
⅞-in. through 1 in.	4

METALLURGICAL COKE

Price net ton

BEEHIVE OVENS

Connellsvill fur.	$14.50-15.00
Connellsvill fdy.	16.50-17.50
New River foundry	20.50
Wise county, foundry	15.95
Wise county, furnace	15.20

OVEN FOUNDRY COKE

Kearney, N. J. ovens	$22.75
Everett, Mass. ovens:	
New England, del.	*24.80
Chicago ovens	23.00
Chicago, del.	24.50
Terre Haute, ovens	22.50
Milwaukee, ovens	23.75
Indianapolis, ovens	22.75
Chicago, del.	26.62
Cincinnati, del.	25.85
Detroit, del.	27.05
Ironton, O., ovens	22.50
Cincinnati, del.	25.12
Painesville, O. ovens	24.00
Cleveland, del.	25.82
Erie, Pa., ovens	23.50
Birmingham, ovens	20.30
Cincinnati, del.	25.23
LoneStar, Tex., ovens	18.50
Philadelphia, ovens	22.70
Nevillelsland, Pa., ovens	23.00
Swedeland, Pa., ovens	22.60
St. Louis, ovens	
St. Louis, del.	25.40
Portsmouth, O., ovens	22.50
Cincinnati, del.	25.12
Detroit, ovens	24.00
Detroit, del.	25.60
Buffalo, del.	26.58
Flint, del.	26.73
Pontiac, del.	25.56
Saginaw, del.	27.08

*Or within $4.55 freight zone from works.

NOTE: current prices on boiler tubes, coal chemicals, fluorspar, electrodes, rivets and wrought washers appeared on page 127 Oct. 27 issue.

STAINLESS STEEL

(Add 4.7% on base price and extras)

Type	Sheets	C.R. Strip	Bars Wire Structurals
301	41.00	34.00	31.25
302	41.25	36.75	31.50
303	43.25	40.25	34.00
304	43.25	38.75	33.00
309	56.00	55.00	44.75
316	57.00	59.00	49.25
321	49.25	48.25	37.00
347	53.75	52.25	41.50
410	36.50	30.50	25.75
416	37.00	37.00	26.25
420	44.00	47.00	31.25
430	39.00	31.00	26.25
501	27.50	26.00	14.25
502	28.50	27.00	15.25

Bait Types 301-347 and 430 sheets, except 303 and 309 E2.

Brackenridge, Pa. sheets A4 quotes slight variations on Types 301-347.

Bridgeville, Pa., bars, wire, sheets & strip U4.

Butler, Pa., sheets and strip except Types 303, 309, 416, 420, 501 & 502, A10.

Carnegie, Pa., sheets and strip except Types 303, 416, 501 & 502 S18.

Cleveland, strip A7.

Detroit, strip M1 quotes 34.00c on Type 301; 36.50c 302; 38.50c, 304; 58.50c 316; 52.00c, 347; 30.50c, 410; 31.00c, 430.

Dunkirk, N. Y., bars, wire A4 quotes slight variations on Types 301-347.

Duquesne, Pa., bars U5.

Fort Wayne, Ind., bars and wire, except Types 501 & 502 J6 quotes slight variations on Types 301-347.

Gary, Ind., sheets except Type 416 U5.

Harrison, N. J., strip and wire C18.

Massillon, O., all items, R2.

McKeesport, Pa., strip, Type 410; bars & wire, Types 410 through 430 and 31.25c on Type 302, 33.75c on 303, 32.75c on 304, 48.75c on 316, 36.75c on 321, 41.25c on 347 F2.

McKeesport, Pa., bars, sheets except Type 416 U5.

Middletown, O., sheets and strip except Types 303, 416, 420, 501 and 502 A10.

Midland, sheets & strip C18.

Munhall, Pa., bars U5.

Muncie, Ind., wire I-7 quotes types 302, 304, 430.

Pittsburgh, sheets C18.

Reading, Pa., strip except 34.25c on Type 301 and 56.00c on 309; bars except 31.50c on Type 301 and 45.25c on 309 C4.

Sharon, Pa., strip except Types 303, 309, 416, 501, 502 and 34.25c on Type 301 S3.

So. Chicago, Ill., bars & structurals U5.

Syracuse, N. Y., bars, wire & structurals C18.

Titusville, Pa., bars U4.

Wallingford, Conn., strip W2 quotes 0.25c higher.

Washington, Pa., bars, sheets & strip, except 0.25c higher on Type 301 J3.

Washington, Pa., Types 301 through 347 sheets & strip except 303, 309, 316 sheets 62.00c, strip 64.00c W4.

Watervliet, N. Y., structurals & bars A4 quotes variations on Types 301-347.

Waukegan, bars & wire A7.

West Leechburg, Pa., strip, A4 quotes slight variations on Types 301-347.

Youngstown, strip except Types 303, 309, 316, 416, 501 and 502 and 34.25c on Type 301 C8.

METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh, except as otherwise noted)

Sponge iron:	Cents
98+ % Fe, annealed	18.00
Unannealed	14.50
Swedish, c.i.f. New York, in bags	8.85-9.95
Electrolytic iron:	
Annealed, 99.5% Fe	42.50
Unannealed (99 + % Fe)	36.50
Unannealed, 99 + % Fe (minus 325 mesh)	53.50
Powder Flakes	48.50
Carbonyl Iron:	
97.9-99.8% size 5 to 10 microns	$3.00-148.00
Aluminum:	
Carlots, freight allowed	31.00
Atomized, 500 lb drums, freight allowed	33.00
Antimony, 500 lb lots	71.00
Brass, 20-ton lots	28.25-32.00
Bronze, 10-ton lots	51.25-60.00
Phosphor-Copper, 20-ton lots	50.00
Copper:	
Electrolytic	37.25
Reduced	34.75
Lead	22.50
Magnesium	75.00-85.00
Manganese:	
Minus 100 mesh	57.00
Minus 35 mesh	52.00
Minus 200 mesh	62.00
Nickel unannealed	86.00
Nickel-Silver 5-ton lots	44.50
Silicon	38.50
Solder (plus cost of metal)	8.50
Stainless Steel, 302	83.00
Zinc, 10-ton lots	20.00-28.00
Tungsten	Dollars
Melting grade, 99% 60 to 200 mesh:	
1000 lb and over	5.85
Less than 1000 lb	6.00
Molybdenum:	
99.9% minus 200 mesh	3.24
Chromium, electrolytic 99% Cr min.	3.50

"I urge every American employer to promote the Payroll Savings Plan . . ."

DECHARD A. HULCY, PRESIDENT
Chamber of Commerce of the United States

"I urge every American employer to promote the Payroll Savings Plan among his employees as a means of building a reservoir of savings."

As President of the Chamber of Commerce of the United States . . . with literally thousands of contacts throughout industry and commerce . . . Mr. Hulcy is uniquely qualified to evaluate the Payroll Savings Plan.

As a business man, Mr. Hulcy puts his finger on a most important accomplishment of the Payroll Savings Plan: the enormous reservoir of savings, *future purchasing power*, built up by systematic saving.

Today, millions of Americans hold Series E Defense Bonds totaling $34.7 Billion. It will surprise many to learn that this figure is $13 Billion greater than on V-J Day. And the $34.7 Billion total of outstanding Defense Bonds is mounting as more and more employers recognize the importance of the Payroll Savings Plan. During 1951 there was a sizable increase in the number of men and women saving through Payroll Saving Plans where they work.

During the calendar year 1951, 45,500,000 $25 Series E Bonds were purchased — a gain of 17% over the previous year. 12,000,000 $50 E Bonds were purchased in the same period, 14% over the previous year. $25 and $50 denominations are the bonds bought by Payroll Savers.

Building a reservoir of savings and future purchasing power . . . contributing to America's defense effort . . . helping to maintain America's economic stability by providing a check on inflationary tendencies, the Payroll Savings Plan is doing a three-way job.

If your company hasn't a Payroll Plan, or if your employee participation is less than 60%, the Savings Bond Division, U. S. Treasury Department will be glad to help you take your place among America's Honor Roll of "Companies on Payroll Savings". Phone, wire or write to Suite 700, Washington Building, Washington, D. C.

The U.S. Government does not pay for this advertising. The Treasury Department thanks, for their patriotic donation, the Advertising Council and

STEEL

The Weekly Magazine of Metalworking

WAREHOUSE STEEL PRODUCTS

(Representative prices, cents per pound for delivery within switching limits, subject to extras.)

	SHEETS			STRIP		BARS			Standard Structural Shapes	PLATES	
	H.R. 18 Ga., Heavier*	C.R.	Gal. 10 Ga †	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.	H.R. Alloy 4140††		Carbon	Floor
New York (city)	6.56	7.57	8.77	6.86		6.89	7.83‡	11.34	6.69	6.90	8.31
JerseyCity(c'try)	6.35	7.27	8.47	6.75		6.59	7.53	9.54	6.39	6.60	8.01
Boston (city)	6.71	7.56	8.88	6.75		6.62	7.69‡	10.80‡	6.76	7.00	8.18
Boston (c'try)	6.51	7.36	8.68	6.55		6.42	7.49‡	10.60‡	6.56	6.80	7.98
Phila. (city)	6.36	7.38	8.60	6.70	8.55	6.67	7.70‡	11.04	6.42	6.49	7.62
Phila. (c'try)	6.11	7.13	8.35	6.45	8.30	6.42	7.45‡	10.79	6.17	6.24	7.36
Balt. (city)	6.01	7.37	8.62	6.62		6.61	7.62‡	11.37	6.67	6.67	7.90
Balt. (c'try)	5.81	7.17	8.42	6.42		6.41	7.42‡	11.17	6.47	6.47	7.70
Norfolk, Va.	7.60	...	...	...		6.44	8.45	...	7.25	6.64	7.33
Richmond, Va.	6.14	6.95	8.68	6.53		6.30	7.38	...	6.58	6.68	7.80
Wash. (w'hse)	6.31	7.61	8.90	6.89		6.90	7.78	...	6.93	6.95	8.17
Buffalo (del.)	6.00	6.85	8.66	6.41		6.10	7.15‡	11.27	6.28	6.50	7.87
Buffalo (w'hse)	5.80	6.65	8.46	6.21		5.90	6.95‡	11.07	6.08	6.30	7.67
Pitts. (w'hse)	5.80	6.65	8.05	5.97		5.83	6.90‡	10.65	5.95	5.95	7.18
Detroit (w'hse)	6.07	6.92	8.69	6.13	7.70-8.03	6.12	7.10‡	10.92	6.42	6.47	7.52
Cleveland (del.)	6.00	6.85	8.39	6.20		6.09	7.10‡	10.99	6.48	6.37	7.71
Cleve. (w'hse)	5.80	6.65	8.19	6.00		5.89	6.90‡	10.79	6.28	6.17	7.51
Cincin. (city)	6.28	6.87	8.67	6.29		6.28	7.31‡	11.22	6.57	6.62	7.75
Chicago (city)	6.00	6.85	8.25	6.03		6.03	7.00‡	10.55	6.15	6.20	7.38
Chicago (w'hse)	5.80	6.65	8.05	5.83		5.83	6.80‡	10.65	5.95	6.00	7.18
Milwau. (city)	6.17	7.02	8.42	6.20		6.20	7.27‡	11.02	6.32	6.37	7.55
Milwau. (c'try)	5.97	6.82	8.22	6.00		6.00	7.07‡	10.82	6.12	6.17	7.35
St. Louis (del.)	6.30	7.14	8.55	6.34		6.33	7.40‡	11.15	6.55	6.60	7.78
St. L. (w'hse)	6.10	6.94	8.35	6.14		6.13	7.20‡	10.95	6.35	6.40	7.58
Birm'hm (city)	5.95	6.80	7.85§	5.95		5.95	8.40	...	6.10	6.25	8.65
Birm'hm(w'hse)	5.80	6.65	7.70§	5.80		5.80	8.40	...	5.95	6.10	8.65
Los Ang. (city)	6.80	8.65	9.95	6.95	11.40	6.80	8.80‡	12.25	6.84	6.91	9.67
L. A. (w'hse)	6.60	8.45	9.75	6.75	11.20	6.60	8.60‡	12.05	6.64	6.71	9.47
Seattle-Tacoma	7.36	8.23	10.00	7.39	...	7.44	9.62‡	10.90‡	6.95	7.19	9.12
SanFran.(w'hse)	6.90	8.20	9.60	6.75	...	6.65	8.70‡	12.05	6.50	6.75	8.90

*Prices do not include gage extras; † prices include gage and coating extras, except Birmingham (coating extra excluded), and Los Angeles (gage extra excluded); ‡ includes 25-cent special bar quality extra; § as rolled; †† as annealed. Base quantities, 2000 to 9999 lb except as noted. Cold-rolled strip, 2000 lb and over; cold-finished bars, 2000 lb and over; §—500 to 1499 lb; ‡—450 to 1499 lb; §—1000 to 1999 lb.

Ores

Lake Superior Iron Ore

Gross ton, 51½% (natural), lower lake ports.

Old range bessemer	$9.45
Old range nonbessemer	9.30
Mesabi bessemer	9.20
Mesabi nonbessemer	9.05
High phosphorus	9.05

After adjustment for analysis, prices will be increased or decreased as the case may be for increases or decreases after Dec. 1, 1950, in applicable basic vessel rates, upper lake rail freights, dock handling charges and taxes thereon.

Eastern Local Iron Ore

Cents per unit del., E. Pa.

Foundry and basic 56-62% concentrates contract	17.00

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68%:	
Spot	nom.
Long-term contract	24.00
North African hematities (spot)	26.00-28.00
Brazilian iron ore, 67-69% (spot)	32.00

Tungsten Ore

Net ton unit, duty paid

Foreign wolframite and scheelite, per net ton unit	$65.00
Domestic scheelite, mines	65.00

Manganese Ore

Manganese, 48% nearby, $1.18-1.22 per long ton unit, c.i.f. U. S. ports, duty for buyer's account; shipments against old contracts for 48% ore are being received from some sources at 85c-87c.

Chrome Ore

Gross ton, f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.

Indian and African	
48% 2.8:1	$39.00-42.00
48% 3:1	44.00-45.00
48% no ratio	30.00-32.00
South African Transvaal	
44% no ratio	$27.00-28.00
48% no ratio	34.00-35.00
Brazilian	
44% 25:1 lump	nom.
Domestic (Rail nearest seller)	
48% 3:1	$39.00

Molybdenum

Sulphide concentrates per lb, molybdenum content, mines	$1.00

REFRACTORIES

(Ceiling prices, effective Sept. 23, 1952, per 1000 units)

Fire Clay Brick

High-Heat Duty: Pueblo, Colo., $89.00; Ashland, Grahn, Hayward, Hitchins, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lochhaven, Lumber, Orviston, West Decatur, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parral, Portsmouth, O., Ottawa, Ill., Stevens Pottery, Ga., Woodbridge, N. J., $99.30; Salina, Pa., $104.55; Niles, O., $109; Los Angeles, Pittsburg, Calif., $132.30.

Silica Brick

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Portsmouth, O., $99.30; Hays, Pa., $105.10; Niles, O., $107; E. Chicago, Ind., Joliet, Rockdale, Ill., $109.70; Cutler, Utah, $116.55; Los Angeles, $122.85.

Insulating Fire Brick

2300° F: Massillon, O., $178.50; Clearfield, Pa., $179.55; Augusta, Ga., Beaver Falls, Zelienople, Pa., Mexico, Mo., $186.90.

Ladle Brick

Dry Pressed: Bessemer, Ala., $64.60; Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Pa., Wellsville, O., $69.30; Mexico, Mo., $73.50; Clearfield, Pa., Portsmouth, O., $83; Peria, Ark., $92.40; Los Angeles, $110.25; Pittsburg, Calif., $111.30.

Sleeves

Reesdale, Pa., $127; Johnstown, Pa., $127.30; Clearfield, Pa., $135; St. Louis, $138; Athens, Tex., $140.90.

Nozzles

Reesdale, Pa., $203.20; Johnstown, Pa., $208.40; Clearfield, Pa., $219.45; St. Louis, $224.65; Athens, Tex., $225.20.

Runners

Reesdale, Pa., $158.20; Johnstown, Pa., $161.70; Clearfield, Pa., $168.60; St. Louis, $170.30; Athens, Tex., $174.40.

High-Alumina Brick

50 *Per Cent:* Clearfield, Pa., St. Louis, Mexico, Mo., $166.30; Danville, Ill., $169.30.

60 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $210.20; Danville, Ill., $213.20.

70 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $244.85; Danville, Ill., $247.85; Clearfield, Pa., $252.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Contract, carload, lump, bulk 20.0c per lb of alloy, carload packed 20.8c, ton lot 22.3c, less ton 23.3c. Delivered. Spot add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.50-3%). Contract, carload, lump, bulk 10.0c per lb of alloy, carload packed 20.2c, ton lot 22.1c, less ton 23.6c. Deld. Spot add 0.25c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 30-43%, Fe 40-45%, C 0.20% max.). Contract, c.l. lump, bulk 7.0c per lb of alloy, c.l. packed 7.75c, ton lot 8.5c, less ton 9.35c. Delivered. Spot add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max.). Contract, carload, lump, packed 20.25c per lb of alloy, ton lot 21c, less ton 22.25c. Freight allowed. Spot add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx. 3¾ lb each and containing exactly 2 lb of Cr). Contract, carload, bulk, 14.50c per lb of briquet, carload packed 15.2c, ton 16.0c, less ton 16.9c. Deld. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx. 3 lb and containing exactly 2 lb of Mn). Contract, carload, bulk 12.45c per lb of briquet, c.l. packaged 13.25c, ton lot 14.05c, less ton 14.95c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx. 3½ lb and containing exactly 2 lb of Mn and approx. 1¾ lb of Si). Contract, c.l. bulk 12.65c, per lb of briquet, c.l. packed 13.45c, ton lot 14.25c, less ton 15.15c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size — weighing approx. 5 lb and containing exactly 2 lb of Si). Contract, carload, bulk 6.95c per lb of briquet, c.l. packed 7.75c, ton lot 8.85c, less ton 9.45c. Delivered. Spot, add 0.25c.

(Small size—weighing approx. 2½ lb and containing exactly 1 lb of Si). Carload, bulk 7.1c, c.l. packed 7.9c, ton lot 8.7c, less ton 9.6c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each) $1.14 per pound of Mo contained, f.o.b. Langeloth, Pa.

Note: Current prices on chromium, silicon, vanadium, boron and tungsten alloys appeared on page 129, Oct. 27 issue; manganese and titanium alloys and "other" ferroalloys, page 155, Oct. 20.

CEILING PRICES, IRON AND STEEL SCRAP

Prices as set forth in Office of Price Stabilization ceiling price regulation No. 5, as amended Feb. 5, 1952.

STEELMAKING SCRAP COMPOSITE

Oct. 30	$43.00
Oct. 23	43.00
Sept., 1952	43.00
Oct., 1951	43.60
Oct., 1947	29.85

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

Basing point ceiling prices per gross ton from which maximum shipping prices are computed on scrap of dealer and industrial origin and from which ceiling on the and ceiling delivered prices are computed on scrap of railroad origin:

Basing Point	No. 1 Bundles Dealer, Industrial	No. 1 Heavy Melt Railroad
Alabama City, Ala.	$40.00	$41.00
Ashland, Ky.	42.00	44.00
Atlanta, Ga.	40.00	43.00
Bethlehem, Pa.	42.00	44.00
Birmingham, Ala.	39.00	41.00
Brackenridge, Pa.	44.00	46.00
Buffalo, N. Y.	43.00	45.00
Butler, Pa.	44.00	46.00
Canton, O.	44.00	46.00
Chicago, Ill.	42.50	44.50
Cincinnati, O.	43.00	45.00
Claymont, Del.	42.50	44.50
Cleveland, O.	43.00	45.00
Coatesville, Pa.	42.50	44.50
Conshohocken, Pa.	42.50	44.50
Detroit, Mich.	41.15	43.15
Duluth, Minn.	40.00	42.00
Harrisburg, Pa.	42.50	44.50
Houston, Tex.	37.00	39.00
Johnstown, Pa.	44.00	46.00
Kansas City, Mo.	39.50	41.50
Kokomo, Ind.	42.00	44.00
Los Angeles	35.00	37.00
Middletown, O.	43.00	45.00
Midland, Pa.	44.00	46.00
Minnequa, Colo.	38.00	40.00
Monessen, Pa.	44.00	46.00
Phoenixville, Pa.	42.50	44.50
Pittsburg, Calif.	35.00	37.00
Pittsburgh, Pa.	44.00	46.00
Portland, Oreg.	35.00	37.00
Portsmouth, O.	42.00	44.00
St. Louis, Mo.	41.00	43.00
San Francisco	35.00	37.00
Seattle, Wash.	35.00	37.00
Sharon, Pa.	44.00	46.00
Sparrows Pt., Md.	42.00	44.00
Steubenville, O.	44.00	46.00
Warren, O.	44.00	46.00
Weirton, W. Va.	44.00	46.00
Youngstown, O.	44.00	46.00

Differentials from Base

Differentials per gross ton for other grades of dealer and industrial scrap:

O-H and Blast Furnace Grades	
2 No. 1 Bushelling	Base
3 No. 1 Heavy Melting	$1.00
4 No. 2 Heavy Melting	3.00
5 No. 2 Bundles	1.00
6 Machine Shop Turnings	10.00
7 Mixed Borings and Short Turnings	6.00
8 Shoveling Turnings	6.00
9 No. 2 Bushelling	4.00
10 Cast Iron Borings	6.00
Elec. Furnace and Fdry. Grades	
11 Billet, Bloom & Forge Crops	7.50
12 Bar Crops & Plate	5.00
13 Cast Steel	5.00
14 Punchings & Plate Scrap	2.50
15 Electric Furnace Bundles	2.00
Cut Structurals & Plate	
16 3 feet and under	3.00
17 2 feet and under	5.00
18 1 foot and under	6.00
19 Briquetted Cast Iron Borings	Base
Foundry Steel	
20 2 feet and under	Base
21 1 foot and under 6	2.00
22 Springs and Crankshafts	1.00
23 Alloy Free Turnings	3.00
24 Heavy Turnings	1.00
25 Briquetted Turnings	Base
26 No. 1 Chemical Borings	3.00
27 No. 2 Chemical Borings	4.00
28 Wrought Iron	10.00
29 Shafting	10.00
31 Old Tin & Terne Plated Bundles	10.00

Unprepared Grades

When compressed constitutes:

32 No. 1 Bundles	6.00
33 No. 2 Bundles	9.00
34 Other than material suitable for hydraulic compression	8.00

Restrictions on Use

(1): Prices for Grades 11 and 23 may be charged only when shipped to a consumer directly from an industrial producer. Otherwise ceiling prices shall not exceed prices established for grades 12 and 8, respectively.

(2): Prices established for Grades 26 and 27 may be charged only when sold for use for chemical or annealing purposes and in the case of Grade 27 for briquetting and direct charge into an electric furnace; otherwise ceiling prices shall not exceed price established for Grade 10.

(3): Prices established for Grade 28 may be charged only when sold to a producer of wrought iron other than one whose ceiling price shall not exceed ceiling price for corresponding grade of basic open hearth.

(4): Premiums for Grades 11, 18, 20 and 21 may be charged only when sold for use in electric and acid open-hearth furnaces or foundries or in basic O-H or blast furnace under NPA allocation or OPS authorization.

(5): Prices for Grade 29 may be charged only when sold for forging or rerolling purposes.

Differentials from Base

Differentials per gross ton above or below the price of Grade 1 (No. 1 railroad heavy melting steel) for other grades of railroad steel scrap:

2 No. 2 Heavy Melting Steel	$2.00
3 No. 2 Steel Wheel	Base
4 Hollow Bored Axles and Solid Axles with key-ways between the wheelseats	Base
5 No. 1 Bushelling	3.50
6 No. 1 Turnings	3.00
7 No. 2 Turnings, Drillings & Borings	12.00
8 No. 2 Cast Steel and tough wheelcutters	6.00
9 Uncut Rerolling Switches	Base
10 Flues, Tubes & Pipes	8.00
11 Structural, Wrought Iron and/or steel, uncut	6.00
12 Destroyed Steel Cars	8.00
13 No. 1 Sheet Scrap	9.50
14 Scrap Rails, Random Lengths	2.00
15 Rerolling Rails	7.00
Cut Rails	
16 3 feet and under	5.00
17 2 feet and under	6.00
18 18 inches and under	8.00
19 Cast Steel, No. 1	3.00
20 Uncut Tires	2.00
21 Cut Tires	5.00
Bolsters & Side Frames	
22 Uncut	Base
23 Cut	3.00
24 Angles, Splice Bars & Tie Plates	5.00
25 Solid Steel Axles	12.00
26 Steel Wheels, No. 3 oversize	Base
27 Steel Wheels, No. 3	5.00
28 Spring Steel	5.00
29 Couplers & Knuckles	5.00
30 Wrought Iron	8.00
31 Firebexes	8.00
32 Rollers	6.00
33 No. 2 Sheet Scrap	11.00
34 Carsides, Ends, Doors, Car Ends, cut apart	6.00
35 Unassorted Iron & Steel	6.00
36 Unprepared scrap, not suitable for hydraulic compression	8.00

Preparation Charges

Ceiling fees per gross ton which may be charged for intransit preparation of any grade of steel scrap of dealer or industrial origin, authorized by OPS are:

(1): For preparing into Grades No. 3, No. 4 or No. 5, $8.
(2): For hydraulically compressing Grade No. 1, $6 per ton; Grade No. 5, $8.
(3): For crushing in Grade No. 6, $3. For preparing into:
(4): Grade No. 25, $6.
(5): Grade No. 19, $6.
(6): Grades No. 12, No. 13, No. 14, No. 16 or No. 20, $10.
(7): Grade No. 17 or No. 21, $11.
(8): Grade No. 18, $12.
(9): For hydraulically compressing Grade No. 15, $8.
(10): For preparing into Grade No. 28, $10.

Ceiling fees per gross ton which may be charged for intransit preparation of any grade of steel scrap of railroad origin shall be:

(1): For preparing into Grade No. 1 and Grade No. 2, $8.
(2): For hydraulically compressing Grade No. 13, $6. For preparing into:
(3): Grade No. 16, $4.
(4): Grade No. 17, $5.
(5): Grade No. 18, $7.
(6): Grade No. 21, $4.
(7): Grade No. 23, $4.

Ceiling fees per gross ton which may be charged for intransit preparation of cast iron are limited to:

(1): For preparing Grade No. 8 into Grade No. 7, $9.
(2): For preparing Grade No. 3 into Grade No. 11, $7.
(3): For preparing Grade No. 3 into Grade No. 1, $4.

CAST IRON SCRAP

Ceiling price per gross ton for following grades shall be f.o.b. shipping point:

Cast Iron:	
1 No. 1 (Cupola)	$49.00
2 No. 2 (Charging Box)	47.00
3 No. 3 (Hvy. Breakable)	45.00
4 No. 4 (Burnt Cast)	41.00
5 Cast Iron Brake Shoes	41.00
6 Stove Plate	46.00
7 Clean Auto Cast	52.00
8 Unstripped Motor Blocks	43.00
9 Wheels, No. 1	47.00
10 Malleable	55.00
11 Drop broken machinery	52.00
Unstripped motor blocks	35.00-37.00
Malleable	50.00-52.00
Drop broken machinery	48.00-50.00

OPEN MARKET

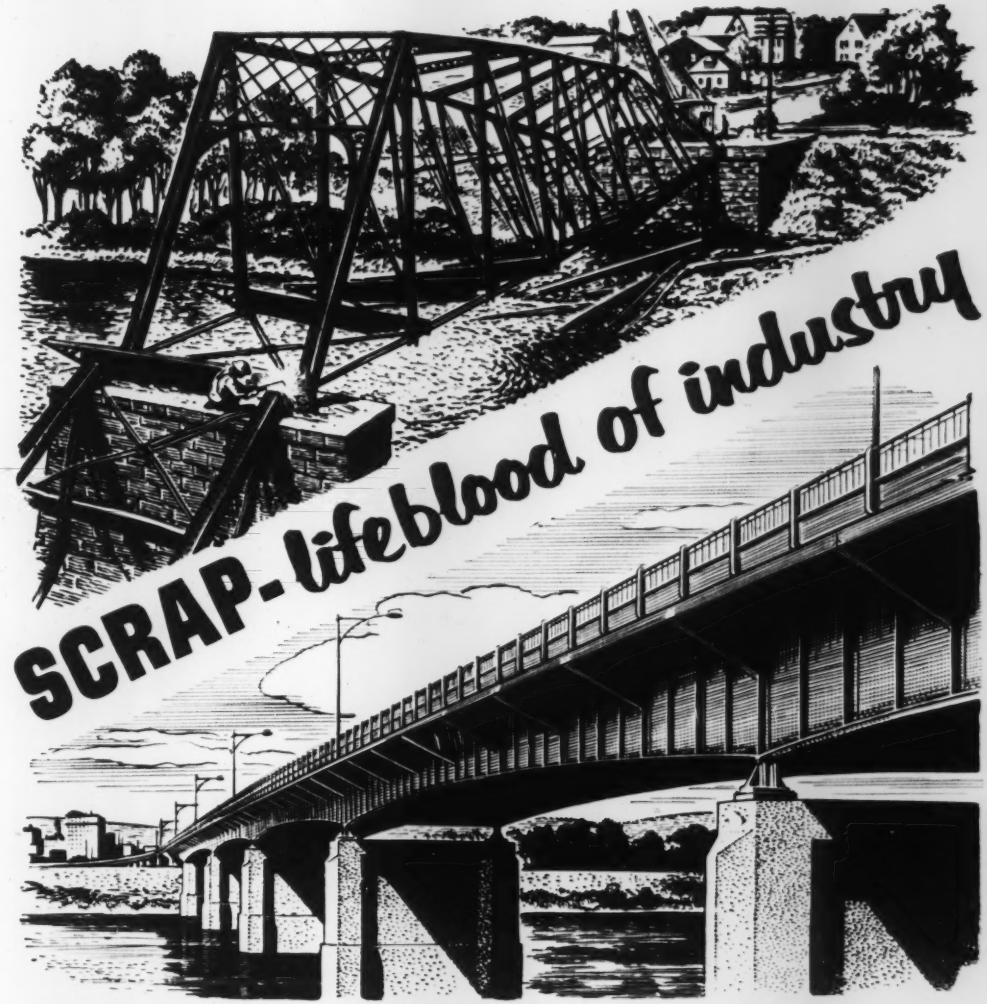
(Delivered prices include broker's commission.)

Birmingham (Delivered)	
Shoveling turnings	$40.00-42.00
Cast iron borings	40.00-42.00
No. 1 cupola cast	47.00-48.00
Stove plate	42.00
Charging box cast	36.00-40.00
Heavy breakable	36.00-37.00
Drop broken machinery	42.00-43.00
Unstripped motor blocks	35.00-36.00
Boston (F.o.b. shipping point)	
No. 1 cupola cast	41.00
Heavy breakable	36.00
Stove plate	34.00-35.00
Unstripped motor blocks	30.00
Buffalo (Delivered)	
No. 1 heavy melting	43.00
No. 2 heavy melting	43.00
No. 1 bundles	44.00
No. 1 bushelling	44.00
No. 2 bundles	43.00
Machine shop turnings	34.00
Mixed borings turnings	38.00
Cast iron borings	38.00
Short shoveling turnings	38.00
No. 1 cupola cast	45.50-46.50
No. 1 machinery cast	49.00-50.00
Chicago (Delivered)	
No. 2 heavy melting	42.50
No. 2 bundles	42.50
Machine shop turnings	33.50
Mixed borings turnings	35.00-37.50
Shoveling turnings	37.50
Cast iron borings	35.00-37.50
No. 1 cupola cast	45.00-47.00
Charging box cast	43.00-45.00
Heavy breakable	41.00-43.00
Burnt cast	37.00-39.00
Cast iron brake shoes	39.00-41.00
Stove plate	44.00-46.00
Clean auto cast	50.00-52.00
Unstripped motor blocks	35.00-37.00
Malleable	50.00-52.00
Drop broken machinery	48.00-50.00
Cleveland (Delivered)	
No. 1 heavy melting	43.00
No. 2 heavy melting	43.00
No. 1 bundles	44.00
No. 2 bundles	43.00
Machine shop turnings	34.00
Mixed borings turnings	38.00
Shoveling turnings	38.00
Cast iron borings	38.00
(F.o.b. shipping point)	
No. 1 cupola	49.00
Charging box cast	47.00
Burnt cast	41.00
Stove plate	46.00
Clean auto cast	52.00
Unstripped motor blocks	43.00
Malleable	55.00
Drop broken machinery	52.00
Detroit (F.o.b. shipping point)	
No. 1 cupola cast	47.00-48.00
Heavy breakable	43.00-44.00
Clean auto cast	49.00-50.00
Unstripped motor blocks	40.00-41.00
Drop broken machinery	48.00-49.00
Charging box cast	44.00-45.00
(Nominal)	
Los Angeles (Delivered)	
No. 2 bundles	29.00
No. 1 cupola cast	49.00
New York (Brokers' buying prices)	
No. 2 heavy melting	35.99
Mixed borings, turnings	29.99
Machine shop turnings	25.99
Cupola cast	42.00-43.00
Unstripped motor blocks	36.00-37.00
Philadelphia (Delivered)	
No. 1 heavy melting	41.50
No. 2 heavy melting	41.50
No. 1 bundles	42.50
No. 2 bundles	41.50
No. 1 bushelling	42.50
Mixed borings, turnings	36.50
Machine shop turnings	32.50
Short shoveling turnings	36.50
No. 1 cupola cast	48.00-50.00
Unstripped motor blocks	42.00
Heavy breakable	45.00
Machinery cast	52.00
Charging box cast	47.00
(Ceiling price. (Nominal. (Shipping point. (Delivered.	
No. 2 heavy melting	44.00
No. 1 bundles	45.00
No. 2 bundles	44.00
Machine shop turnings	35.00
Shovel turnings	39.00
No. 1 cupola cast	48.50
Heavy breakable	45.00
Ceiling price.	
San Francisco (Delivered)	
No. 2 heavy melting	31.00
Machine shop turnings	17.00
No. 2 bundles	29.00
No. 1 cupola cast	44.00
Seattle (F.o.b. shipping point)	
No. 1 cupola cast	41.00
Heavy breakable	36.00-38.00
Unstripped motor blocks	31.00
St. Louis (Delivered)	
No. 1 cupola	48.00
Unstripped motor blocks	38.00
Youngstown (Delivered)	
No. 2 heavy melting	43.00
No. 2 bundles	43.00
Machine shop turnings	34.00

HAMILTON, ONT.

(Delivered Prices)

Heavy Melt	$35.50
No. 1 Bundles	35.50
No. 2 Bundles	35.50
Mechanical Bundles	32.00
Mixed Steel Scrap	31.50
Mixed Borings, Turnings	32.50
Rails, Remelting	35.50
Rails, Rerolling	44.50
Bushelling	30.00
Bushelling new factory:	
Prep'd	33.50
Unprep'd	31.50
Short Steel Turnings	32.50
Cast Iron Grades:	
No. 1 Machinery Cast	50.00
(F.o.b. shipping point.	



CONSULT OUR NEAREST OFFICE FOR THE PURCHASE AND SALE OF SCRAP

LURIA BROTHERS AND COMPANY, INC.

MAIN OFFICE
LINCOLN-LIBERTY BLDG.
Philadelphia 7, Penna.

PLANTS

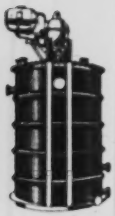
LEBANON, PENNA.
READING, PENNA.
MODENA, PENNA.
ERIE, PENNA.
DETROIT (ECORSE), MICHIGAN
PITTSBURGH, PENNA.

OFFICES

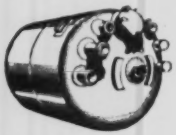
BIRMINGHAM, ALA.
BOSTON, MASS.
BUFFALO, N. Y.
CHICAGO, ILLINOIS
CLEVELAND, OHIO
DETROIT, MICH.
HOUSTON, TEXAS
LEBANON, PENNA.
LOS ANGELES, CAL.
NEW YORK, N. Y.
SEATTLE, WASH.
PITTSBURGH, PENNA.
PUEBLO, COLORADO
READING, PENNA.
ST. LOUIS, MO.
SAN FRANCISCO, CAL.

LEADERS IN IRON AND STEEL SCRAP SINCE 1889

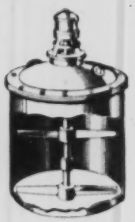
HAYNES Alloy Sheet and Plate



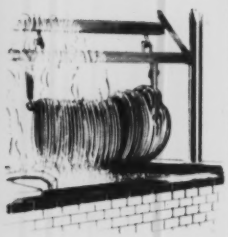
Evaporators



Autoclaves



Agitators



Pickling Equipment

For SEVERE SERVICE conditions

You can obtain sheet and plate of four different HAYNES alloys, all specially designed to combat certain severe service conditions, for the fabrication of processing equipment. The alloys are all strong and highly resistant to heat, oxidation, and chemical corrosion. The chart below will give you an idea of where each is most commonly used.

HAYNES alloy sheet and plate have been used successfully for many different types of fabricated equipment. Typical applications include reaction vessels, condensers, autoclaves, heat exchangers, evaporators, dryers, mixers, agitators, fans, and blowers. The alloys can be fabricated by deep drawing, spinning, pressing, forming, and welding.

All four HAYNES alloys are supplied in hot-rolled sheet and plate in thicknesses of 1 in. down to 24 U. S. Std. (0.025 in.). These materials are furnished annealed and pickled with a commercial No. 1 finish. If you wish further information about HAYNES alloy sheet and plate, contact the nearest Haynes Stellite Company district office.

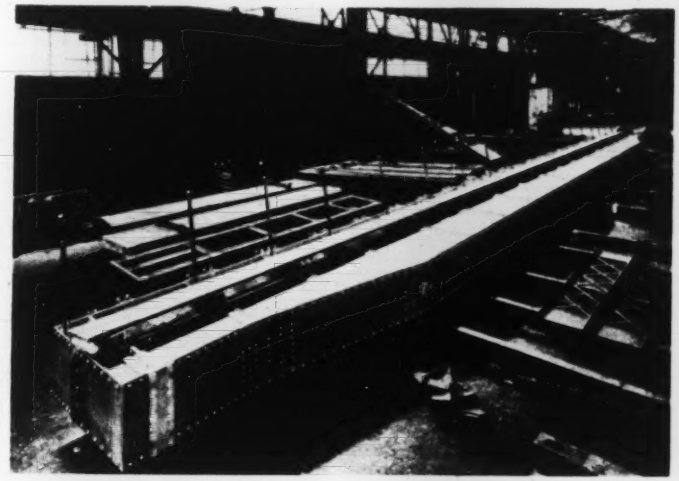
USE SHEET OR PLATE OF	FOR RESISTANCE TO
HASTELLOY Alloy B (nickel-molybdenum-iron)	Hydrochloric acid, wet hydrogen chloride gas, sulphuric acid, phosphoric acid, organic acids, high temperatures.
HASTELLOY Alloy C (nickel-molybdenum-chromium-iron)	Nitric acid, free chlorine, acid salts, hydrochloric acid, sulphuric acid, phosphoric acid, organic acids, sulphurous acid, high temperatures.
MULTIMET Alloy (cobalt-chromium-nickel-iron)	Oxidation, high temperatures.
HAYNES Alloy No. 25 (cobalt-chromium-tungsten-nickel)	Oxidation, high temperatures, carburization, wet chlorine, nitric acid.

HAYNES TRADE MARK *alloys*

"Haynes," "Hastelloy," and "Multimet" are trade-marks of Union Carbide and Carbon Corporation.

Haynes Stellite Company
A Division of
Union Carbide and Carbon Corporation
UCC
General Offices and Works, Kokomo, Indiana
Sales Offices
Chicago — Cleveland — Detroit — Houston
Los Angeles — New York — San Francisco — Tulsa

The Metal Market



Girder To Serve Emergency Dam Needs

About to support an emergency lock closure at the Morgantown, W. Va., lock and dam, this 21,286-pound aluminum box girder awaits duty inside the Neville Island, Pittsburgh, plant of Pittsburgh Des-Moines Co. Designed by army engineers and fabricated by Pittsburgh Des-Moines, the closure will close off the lock under emergency conditions and while repairs are being made in the lock chamber

Diversion to U. S. of Canadian aluminum that was to go to the United Kingdom between December and July will help offset drought-caused losses

LOG-JAM in aluminum is being blasted by inter-governmental action, but effects won't be felt till the first quarter, and only then by paring drought-caused losses. New additions won't match losses to date though.

In a three-way deal instigated by Aluminum Co. of Canada between DPA, the British Ministry of Materials and Aluminum Import Corp., Alcan's U. S. distributor, metal scheduled for shipment to the United Kingdom between December and July will be diverted to the U. S. This country will not have to repay the metal as in past agreements.

Special Delivery—A total of 38,500 tons will be added to the U. S. aluminum supply because of the deal. Instead of the 27,500 to 28,500 tons expected from Canada in December, U. S. fabricators will get 40,000 tons. In the first quarter, the U. S. will get 42,500 tons instead of the 20,000 tons expected, and in the second quarter we'll get 25,000 tons instead of 20,000.

The agreement comprises a new loan of 22,500 tons, plus delay in repayment to Britain of 16,500 tons previously borrowed. This brings the total aluminum obtained from Alcan through the U. K. to 49,500 tons.

Grim Days — Losses because of power shortages will amount to an estimated 60,000 tons by the end of this month, and reduction plants could be down till March unless rains come. Five potlines on the Pacific Coast are already out of operation, and Reynolds late last week took a deadline plea to DEPA to prevent shutdown of its Longview, Wash., potline. Reynolds may face another crisis in mid-November at Listerhill, Ala., if some of its emergency high-cost power is cut off.

NPA may be forced to reduce production directives soon. Mills are allowed to fill production schedules only to 125 per cent, and the schedules are predicated on estimated metal supply. Someone will thus be left out in the cold with his aluminum tickets.

Copper Caution — OPS thinks it might have the answer to the dual domestic copper price. In effect, it amounts to subsidy for high cost producers, including Calumet & Hecla, which got a Capehart increase. Some 10 per cent of current production would be affected, and the domestic ceiling would be fixed at 24.50 cents, with the "premium" set in contracts between DMPA and producers.

November allocations of refined copper to brass mills, wire mills, foundries and powder mill producers were unchanged from October, but copper and copper-base alloy scrap allocations were sliced a neat 10 per cent.

Both quotas represent only authorization to accept delivery if material is available, and many in industry believe the available supply overestimated. Scrap price ceilings keep much metal off the market. One industry member estimated that the price mess has already deprived industry of 175,000 tons of refined scrap from copper so far this year.

Losing Game—Lead and zinc keep chasing each other backwards in price as first one, then the other feels the effect of renewed London lead trading. Zinc should be freed for trading in London by first of the year, but much of the edge has already been removed.

Opinion is still split on whether the market has rounded bottom yet. Producers claim they need a 30-cent combination price to keep in business. Mines are closing now, which will cut supply and maybe pull the market up by its bootstraps.

Reason for Cheer

Copper and brass warehouses think business is looking up, though some lines have been slow in September. Nationwide industry trends, as reported by members to Copper and Brass Warehouse Association, show deliveries from suppliers for all items averaged 65 days. No change was reported in September sales. In the South and West, sales were called good, but just fair in New England, the East and Midwest. Items in particularly short supply, listed in order of their scarcity: Copper bar, copper wire, brass rod, brass tube, bronze rod and brass wire.

Present stock inventory compared with permitted inventory under M-82 showed copper tube topping the list at 95 per cent, followed by alloy sheet, strip, rod and bar at 94 per cent. Copper wire, at 35 per cent of permitted inventory, was scarcest. Other products and percentages of permitted inventory: Copper sheet, 80 per cent; copper rod and bar, 64 per cent; copper strip, 85 per cent; and alloy tube, 73 per cent.

NONFERROUS METALS

(Cents per pound, carlots, except as otherwise noted)

Primary Metals

Copper: Electrolytic 24.50c, Conn. Valley, Lake 24.62½c, delivered.

Brass Ingots: 85-5-5-5 (No. 115): 27.25c; 88-10-2 (No. 215): 40.00c; 80-10-10 (No. 305): 33.00c; No. 1 yellow (No. 405): 23.25c.

Zinc: Prime western 12.50c; brass special 12.75c; intermediate 13.00c; East St. Louis, high grade 13.50c, delivered.

Lead: Common 13.30c; chemical 13.40c; corroding 13.40c, St. Louis.

Primary Aluminum: 99% plus ingots 20.00c, pigs 19.00c. Base prices for 10,000 lb and over. Freight allowed on 500 lb or more but not in excess of rate applicable on 30,000 lb c.l. orders.

Secondary Aluminum: Piston alloys 20.50c, 50c, 12, foundry alloy (No. 2 grade, 19.50c; steel deoxidizing grades notch bars granulated or shot, Grade 1, 18.50c; grade 2, 18.60c; grade 3, 18.40c; grade 4, 18.20c.

Magnesium: Commercially pure (99.8% ; standard ingots, 10,000 lb and over 24.50c, f.o.b. Freeport, Tex.

Tin: Grade A, prompt 121.50c.

Antimony: American, 99.90% and over but not meeting specifications below, 39.00c; 99.8% and over, arsenic 0.06% max., other impurities 0.1% max., 39.50c, f.o.b. Laredo, Tex., for bulk shipments.

Nickel: Electrolytic cathodes, 99.9% base sizes at refinery, unpacked, 56.50c; 25 lb pigs, 59.15c; XX nickel shot, 60.15c; F nickel shot or ingots, for addition to cast iron, 56.50c. Prices include import duty.

Mercury: Open market, spot New York $190-$195 per 76 lb flask.

Beryllium Copper: 3.75-4.25% Be, $1.56 per lb of alloy, f.o.b. Reading, Pa.

Cadmium: Regular straight or flat forms, $2.00 del.; special or patented shapes $2.15.

Cobalt: 97.99% $2.40 per lb for 500 lb (kegs); $2.42 per lb for 100 lb (case); $2.47 per lb under 100 lb.

Gold: U. S. Treasury $35 per ounce.

Silver: Open market, New York 83.25c per oz.

Platinum: $90-$93 per ounce, from refineries.

Palladium: $23-$24 per troy ounce.

Iridium: $200 per troy ounce.

Titanium (sponge form): $5 per pound.

Rolled, Drawn, Extruded Products

COPPER AND BRASS

(Ceiling prices, cents per pound, f.o.b. mill, effective July 1, 1952)

Sheet: Copper 45.52; yellow brass 40.17; commercial bronze, 95% 45.15; 90% 44.38; red brass 85% 43.10, 80% 42.34; best quality 41.45; nickel silver, 18% 55.08; phosphor bronze grade A 5% 64.71.

Rod: Copper, hot rolled 41.37, cold drawn 42.62; yellow brass free cutting, 33.85; commercial bronze, 95% 44.54, 90% 44.07; red brass 85% 42.70, 80% 42.03.

Seamless Tubing: Copper 45.56; yellow brass 41.18; commercial bronze, 90% 47.01; red brass, 85% 46.01.

Wire: Yellow brass 40.46; commercial bronze, 95% 43.44, 90% 44.67; red brass, 85% 43.39, 80% 42.63; best quality brass 41.64.

(Base prices, effective July 1, 1952)

Copper Wire: Bare, soft, f.o.b. eastern mills, 100,000 lb lots 32.70c, 10,000 lb lots 32.92, l.c.l. 33.42. Weatherproof, 100,000 lb 33.60, 10,000 lb 33.85, l.c.l. 34.35. Magnet wire, del. 15,000 lb or more 38.75, l.c.l. 39.50.

ALUMINUM

(30,000 lb base, freight allowed on 500 lb or more, but not in excess of rate applicable on 30,000 lb c.l. orders. Effective Aug. 4, 1952.)

Sheets and Circles: 2s and 3s mill finish c.l.

Thickness Range Inches	Widths or Diameters In.	Inc	Flat Sheet Base*	Coiled Sheet Base	Coiled Sheet Circles† Base
0.249-0.136	12-48		31.6		
0.135-0.096	12-48		32.1		
0.095-0.077	12-48		32.8	30.6	34.9
0.076-0.061	12-48		33.4	30.8	35.1
0.060-0.048	12-48		33.7	31.0	35.4
0.047-0.038	12-48		34.1	31.3	35.7
0.037-0.030	12-48		34.5	31.7	36.3
0.029-0.024	12-48		35.1	32.0	36.8
0.023-0.019	12-36		35.7	32.7	37.5
0.018-0.017	12-36		36.4	33.3	38.4
0.016-0.015	12-36		37.3	34.0	39.5
0.014	12-24		38.3	35.0	40.8
0.013-0.012	12-24		39.3	35.7	41.7
0.011	12-24		40.3	36.8	43.3
0.010-0.0095	12-24		41.4	37.9	44.8
0.009-0.0085	12-24		42.6	39.1	46.6
0.008-0.0075	12-24		44.0	40.3	48.4
0.007	12-18		45.5	41.7	50.6
0.006	12-18		47.0	43.1	55.4

* Lengths 72 to 180 inches. † Maximum diameter 26 inches.

Screw Machine Stock: 5000 lb and over.

Dia. (in.) or distance across flats	Rounds R317-T4 178-T4	Hexagonal R317-T4	178-T4
0.125	54.6		
0.156-0.0188	46.2		
0.219-0.313	43.6		
0.375	42.0	48.3	50.4
0.406	42.0		
0.438	42.0	48.3	50.4
0.469	42.0		
0.500	42.0	48.3	50.4
0.531	42.0		
0.563	42.0		47.3
0.594	42.0		
0.625	42.0	45.7	47.3
0.688	42.0		47.3
0.750-1.000	41.0	43.1	44.6
1.063	41.0		43.1
1.125-1.500	39.4	41.5	43.1
1.563	38.9		
1.625	38.3		41.5
1.688-2.000	38.3		

LEAD

(Prices to jobbers f.o.b. mill, Buffalo, Cleveland, Herculaneum. Sheets, Pull rolls, 140 sq ft or more $18.50 per cwt; add cwt 100 sq ft to 140 sq ft. Pipe, Pull coils $18.50 per cwt. Traps and bends, List prices plus 45%.

ZINC

Sheets 23.00c, f.o.b. mill 36,000 lb and over. Ribbon zinc in coils 20.50c, f.o.b. mill 36,000 lb and over. Plates, not over 12-in., 21.75c; over 12-in., 21.75-22.25c.

"A" NICKEL

(Base prices, f.o.b. mills)

Sheets, cold-rolled 77.00c; Strip, cold-rolled 83.00c; Rods and shapes 73.00c; Plates 75.00c; Seamless tubes 106.00c.

MONEL

(Base prices, f.o.b. mill)

Sheets, cold-rolled 60.50c; Strip, cold-rolled 63.50c; Rods and shapes 58.50c; Plates, 60.50c; Seamless tubes 93.50c; Shot and blocks 53.50c.

MAGNESIUM

Extruded Round: 12 in. long, 1.31 in. in diameter, less than 25 lb, 55.00-62.00c; 25 to 99 lb, 45.00-52.00c; 100 lb to 5000 lb, 41.00c.

TITANIUM

(Prices per lb 10,000 lb and over, f.o.b. mill)

Sheets $15; sheared mill plate, $12; strip, $15; wire $10; forgings, $6; hot-rolled and forged bars, $6.

DAILY PRICE RECORD

1952	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
Oct. 23	24.50	13.30	12.50	121.50	20.00	39.00	56.50	83.25
Oct. 22	24.50	13.30	13.50	121.50	20.00	39.00	56.50	83.25
Oct. 21	24.50	13.30	13.50	121.50	20.00	39.00	56.50	83.25
Oct. 8-13	24.50	13.30	13.50	121.50	20.00	39.00	56.50	83.25
Oct. 7	24.50	13.30-13.50	14.00	121.50	20.00	39.00	56.50	83.25
Oct. 1-6	24.50	13.30-13.50	14.00	121.50	20.00	39.00	56.50	83.25
Sept. Avg.	24.50	13.50	13.99	121.50	20.00	39.00	56.50	83.25
Aug. Avg.	24.50	13.50	14.067	121.50	19.923	39.00	56.50	83.25
July Avg.	24.50	13.50	15.00	121.50	19.00	39.00	56.50	82.885
June Avg.	24.50	13.06	15.74	121.50	19.00	39.00	56.50	82.75
May Avg.	24.50	13.519	19.50	121.50	19.00	42.077	56.50	85.356
Oct. 1951 Avg.	24.50	18.726	19.426	103.00	19.00	42.00	56.50	88.12
Oct. 1947 Avg.	21.50	14.825	10.50	80.00	15.00	33.00	55.00	71.375

NOTE: Copper, Electrolytic, del. Conn. Valley. Lead, common grade, del. St. Louis; Zinc, prime western, E. St. Louis. Tin, Straits, del. New York. Aluminum, primary ingots, 99%, del.; Antimony, bulk, f.o.b. Laredo, Tex. Nickel, electrolytic cathodes, 99.9%, base sizes at refinery, unpacked. Silver, open market, New York. Prices, cents per pound, except silver, cents per ounce.

Plating Materials

Chromic Acid: 99.9% flakes, f.o.b. Philadelphia, carloads 27.00c; 5 tons and over 27.50c; 1 to 5 tons, 28.00c; less than 1 ton 28.50c.

Copper Anodes: Base 2000 to 5000 lb, f.o.b. shipping point, freight allowed. Flat, rolled, 38.34c; oval 37.84c.

Nickel Anodes: Rolled oval, carbonized, carloads, 74.50c; 10,000 to 30,000 lb 75.50c; 3000 to 10,000 lb 76.50c; 500 to 3000 lb 77.50c; 100 to 500 lb, 79.50c; under 100 lb, $2.50c; f.o.b. Cleveland.

Nickel Chloride: 36.50c in 100 lb bags; 34.50c in lots of 300 lb through 10,000 lb; 34.00c over 10,000 lb, f.o.b. Cleveland, freight allowed on 300 lb or more.

Sodium Stannate: 25 lb cans only, less than 100 lb to consumers 86.7c; 100 or 350 lb drums only, 100 to 600 lb 71.60c; 700 to 1900 lb, 69c; 2000 to 9900 lb, 67.3c. Freight allowed east of Mississippi and north of Ohio and Potomac rivers.

Tin Anodes: Bar, 1000 lb and over, $1.42; 500 to 999 lb, $1.425; 200 to 499 lb, $1.43; less than 200 lb, $1.445. Freight allowed east of Mississippi and north of Ohio and Potomac.

Zinc Cyanide: 100 lb drums, less than 10 drums 54.30c, 10 or more drums, 52.30c, f.o.b. Niagara Falls, N. Y.

Stannous Sulphate: 100 lb kegs or 400 lb bbl, less than 2000 lb $1.11; more than 2000 lb, $1.09. Freight allowed east of Mississippi and north of Ohio and Potomac rivers.

Stannous Chloride (Anhydrous): In 400 lb bbl, 98.5c; 100 lb kegs 99.5c. Freight allowed.

Scrap Metals

Brass Mill Allowances

Ceiling prices in cents per pound for less than 20,000 lb, f.o.b. shipping point, effective June 26, 1951.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	21.50	21.50	20.75
Yellow Brass	19.125	18.875	17.875
Commercial Bronze			
95%	20.50	20.25	19.75
90%	20.50	20.25	19.75
Red Brass			
85%	20.25	20.00	19.375
80%	20.125	19.875	19.375
Muntz metal	18.125	17.875	17.375
Nickel silver, 10%	21.50	21.25	10.75
Phos. Bronze, 5%	25.25	25.00	24.00

Copper Scrap Ceiling Prices

(Base prices, cents per pound, less than 40,000 lb f.o.b. point of shipment)

Group 1: No. 1 copper 19.25; No. 2 copper wire and mixed heavy 17.75; light copper 16.50; No. 1 borings 19.25; No. 2 borings 17.75; refinery brass, 17.00 per lb of dry Cu content for 50 to 60 per cent material and 17.25 per lb for over 60 per cent material.

Group II: No. 1 soft red brass solids 18.50; No. 1 composition borings 19.25 per lb of Cu content plus 63 cents per lb of tin content; mixed brass borings 19.25 per pound of Cu content plus 60 cents per lb of tin content; unlined red car boxes 18.25; lined red car boxes 17.25; cocks and faucets 16.00; mixed brass screens 16.00; zincy bronze solids and borings 16.25.

Aluminum Scrap Ceiling Prices

(Cents per pound, f.o.b. point of shipment, less than 5000 lb)

Segregated plant scrap: 2s solids, copper free, 10.50; high grade borings and turnings, 8.50; No. 12 piston borings and turnings, 7.50. Mixed plant scrap: Copper-free solids, 10.00; dural type, 9.00. Obsolete scrap: Pure old cable, 10.00; sheet and sheet utensils, 7.25; old castings and forgings, 7.75; clean pistons, free of struts, 7.75; pistons with struts, 5.75.

DEALERS' BUYING PRICES

(Cents per pound, New York, in ton lots)

Lead: Heavy 10.25-10.75; battery plates 5.50-5.75; linotype and stereotype 12.50; electrotype 10.75; mixed babbitt 13.75.

Zinc: Old zinc, 5.50-6.00; new die cast scrap, 5.50-6.00; old die cast scrap, 4.00-4.50.

Tubular Goods . . .

Tubular Goods Prices, Page 175

Cleveland—Galvanized pipe prices have been revised downward further reflecting the continued decline in the price of zinc. Republic Steel Corp. last week again increased its discounts on galvanized pipe based on zinc at 12.50c per pound. Discount was raised 1 percentage point on ½-in. through 1-in. pipe, ¾ point on 1¼-in. through 2-in. pipe, and ½ point on pipe 2½-in. and over. Other leading makers are expected to announce similar adjustments in discount schedules.

Since galvanized pipe discounts fluctuate in step with changes of 1 cent per pound in zinc, up or down, pipe sales departments of late have been put to it to keep their galvanized price lists in shape. Scarcely is a new galvanized pipe discount schedule printed, it seems, but another 1 cent decline in zinc forces printing of a new list. Since May the zinc price has dropped 7 cents per pound from its peak of 19.50c.

Boston—Cast iron pipe prices have softened. Direct bids bring quotations $10 per ton under listed prices on smaller sizes, 6 to 12-in. Deliveries have improved to four weeks. Distributors of buttweld steel pipe are shading usual markups in western Massachusetts. Most are taking full allotments of merchant steel pipe, but some indicate they may cut back moderately on January or February quotas. Signs indicate seamless pipe will be among the last products to get in balance with demand.

Sheets, Strip . . .

Sheet and Strip Prices, Pages 171 & 172

Cleveland—Decision of government allocation authorities to increase first quarter steel allotments to civilian goods manufacturers by an additional 1,480,000 tons has sheetmakers guessing as to just how their schedules will be affected. Bulk of the additional allotment is expected to be in sheets and strip, and while the auto builders have been able to place all their fourth quarter allotment tickets many other civilian goods makers hold unplaced tickets for the period.

Since the automobile industry accounts for about 35 per cent of sheet consumption it is thought the bulk of the increased first quarter sheet allotment will be to that industry. Although the carryover from fourth quarter is not expected to be as large as recently estimated, supply conditions difficulties are anticipated in actions will continue tight and schedcommodating any new tickets issued for the period.

Currently demand for galvanized sheets appears less pressing than some time back, this being explained by the fact warehouses have been kept well supplied. Users of enameling sheets, however, are desperate for tonnage. Increased use, such as in bathtubs made of formed metal, has added substantially to the mill load.

Boston—While cold-rolled sheet consumers, notably stamping shops, are hard pressed for tonnage, several producers have increased allotments for first quarter. Additional capacity, as a rule, accounts for this increase. Consumers of heavier gages of sheets who had counted on some reduction in steel costs from Morrisville, Pa., are disappointed. Initially, at least, these heavier gages will not be rolled. Placement of first quarter cold-rolled strip tonnage has gained momentum and mill schedules are filling more rapidly. More mills expect to be caught up on overdue military tonnage this month.

Pittsburgh—More comfortable supply of sheets is expected during first half of 1953. Conversion inquiries are picking up but none involve long term commitments. Appliance makers and automotive interests are showing concern about their future supplies. Pittsburgh Steel Co.'s program for finished product capacity expansion by 82 per cent, and ingot capacity increase by 48 per cent is moving toward competition. The new hot-rolled sheet-strip mill is expected in operation by end of first quarter, 1953, and the new cold-rolled sheet-strip mill by end of second quarter.

Birmingham—Sheetmakers are under pressure for tonnage even in the face of some easing in current requirements.

Plates . . .

Plate Prices, Page 171

Chicago—Plate fabricators' inventories are so low they are unworkable and only about 40 per cent of fourth quarter tickets have found a home with mills. First quarter prospects are no better.

The Steel Plate Fabricators Association urged the Defense Production Administration to keep in full force at least through the second quarter of 1953 the directive requiring strip mills to roll light plates. The group says that 84 fabricators from all parts of the country have been able to order an average of only 40 per cent of the tonnage the government permits them to buy for fourth-quarter delivery. Forty-two fabricators report very poor prospects for delivery early in 1953. Twenty-nine say they are in critical condition due to nondelivery during the steel strike and that their already reduced work force will have to be cut further soon.

Boston—In narrow and lighter gages, plate shipments are heavier and fabricating shops are placing the bulk of tickets for first quarter. Heavier plates, however, are difficult to place unless covered with higher ratings. Open space for first quarter is limited and filled with most producers. Lead time for placing orders for clad plates has been extended an additional 45 days. Stocks of floor plates are improved.

Philadelphia—Eastern platemakers, taking carryover from fourth quarter along with set-asides, warehouse orders and conversion work, will be selective in taking civilian orders before March. Heavy defense tonnage is expected, but producers exercise their option of selecting customers for the limited nondefense tonnage and haven't shut off January or February orders yet.

Pittsburgh—Plate supply remains tight. No great improvement in availability for civilian consumers is expected before second quarter.

Birmingham—Plate mills have little tonnage to offer those in nondefense classification and probably will not have for some months. Piplines are still taking a considerable part of southern production.

Los Angeles—Plates are among the products in tightest supply on the West Coast. Still laboring under huge directive tonnages Kaiser Steel Corp. holds little hope of becoming current on third quarter tonnage before February.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 171

Los Angeles—Average price of deformed reinforcing bars in place is 11.2 to 11.5c per pound approximately 12 per cent above first quarter. Demand for plain and deformed bars continues strong.

Seattle—Rolling mills are operating at capacity and deliveries are being speeded. Bulk of output is reinforcing bars. Order backlogs will carry well into first quarter.

Structural Shapes . . .

Structural Shape Prices, Page 171

Boston—Fourth and first quarter allotments to structural shops maintain the ratio of plates to shapes which for third quarter were 684,000 tons of plates and 996,000 tons of shapes.

In this connection, it is significant that of every five tons of steel fabricated by structural shops, two tons are plates. This heavy use of plates means more shop welding facilities are being utilized and that longer and deeper built-up plate girders are required for bridges. Girders are being fabricated up to 400 ft. and 20 to 22 ft. deep.

Bridge sections are frequently designed beyond roll limits for beams and girders. By welding plates in varying thicknesses, 3-in. down to one-half in., design permits a longer and relatively lighter structure.

More plates also are being used for weldments, several fabricating shops having gone into this field actively. More tank work is being done by structural shops also. Where girder depth is over 10 ft. some shops are limited to use of 120-in. plate where punching for riveting is specified.

New York—September shipments of fabricated structural steel amounted to 226,458 tons, according to the American Institute of Steel Construction. This was practically the same tonnage as in the preceding month and was 4 per cent greater than the average monthly rate of 216,778 tons. Total shipments in the first nine months this year were 1,950,999 tons which compares with 2,039,963 in the like period last year.

Bookings during September were 204,754 tons, a drop from the previous month when 253,669 tons were booked. The September total, however, was some 9 per cent greater than the 188,187 tons booked in September, 1951. Bookings for the first nine months this year amounted to 1,936,804 tons, which compares with 2,352,251 in the like period of last year. The industry's order backlog as of Sept. 30 stood at 2,342,374 tons.

It was 2,580,345 tons on Sept. 30, 1951.

Pittsburgh—Set-asides still are eating heavily into run-of-the-mill availability of shapes. Some projects are slowing to a standstill as a result. Inquiries have been received in the Pittsburgh area from several West Coast fabricators.

Seattle—Competition for business is increasing with order backlogs shrinking. Public works jobs are fewer and no major tonnages are pending. Considerable tonnage is involved in expansion of Hanford plant facilities. Difficulty of obtaining items supplied by eastern producers is a problem for fabricators here.

Wire . . .

Wire Prices, Page 173

New York—Volume of wire specialties placed for first quarter is restricted by uncertainty as to allotments for the period. Automotive industry has placed orders for wire, including valve spring, but most consumers in the civilian goods field need more tickets. Users have been able to place authorized volume for fourth quarter and in some cases are pressing for delivery. Demand for precision spring wire, high carbon grades, is stronger. Also consumers are pressing more actively for mattress and bed springs with first quarter allotments 59 per cent of base period tonnage. Razor blade quota is 71 per cent.

Boston—Inroads are steady against delinquent tonnage in wire backlogs. Defense requirements are not up to 16 per cent set-aside. Rate of cutting up heading wire by screw shops fluctuates from 5 to 10 per cent weekly and some manufacturers are building inventory on finished screws. First quarter allotments are ample for current demand. Merchant wire goods, including nails, are slow and prices on the latter with distributors are soft.

Steel Bars . . .

Bar Prices, Page 171

Cleveland—Relatively little new bar tonnage will be open in first quarter to permit additional allotments, especially in the large sizes. This is the view of mills commenting on the government announcement that first quarter steel allotments for the civilian goods manufacturers will be increased. Indications are the bulk of the additional tonnage to be allotted will be in flat-rolled products. The bar carryover from fourth quarter promises to be heavy with military requirements still dominating the supply picture and likely to continue so through first half of 1953 at least.

Boston—Except for larger sizes on which mills are booked through first quarter, schedule openings vary considerably. In general, no new orders can be placed before March. Mills are filled through February. Hot-rolled carbon schedules are filled through February on civilian and January on military requirements. Cold-finished approximates this pattern. All tonnage in smaller sizes is not being taken out by military consumers, although the total is small, barely five per cent.

Philadelphia—Defense tonnage is not running particularly heavy for first quarter. Either defense users lack tickets or they expect heavy deliveries in fourth quarter. If sufficient tonnage comes in during fourth quarter, then first quarter needs can't be too heavy without exceeding inventory regulations. Thus civilian users may see more bars in first quarter.

Los Angeles—Deliveries of hot bars to cold-drawers have been averaging 80 per cent of M-1 tonnage. The difference is expected to be made up by at least one barmaker in December.

Pig Iron . . .

Pig Iron Prices, Page 170

New York—Blast furnace production in September was the largest since that of March.

September output, the American Iron & Steel Institute reports, was 6,164,365 net tons, consisting of 6,095,865 tons of pig iron and 68,500 tons of ferromanganese and spiegel.

The September total is exceeded this year only by the March figure of 6,300,006 tons.

To produce the September total, the country's blast furnaces were operated at 102.1 per cent of capacity.

Because of the steel strikes during the summer, production by blast furnaces in the first nine months of this year totaled only 42,906,676 net tons, compared with 53,146,892 in the corresponding period last year.

Further comparisons follow:

1952	Pig Iron (net tons)	Ferromanganese and Spiegel (net tons)	Total Blast Furnace Output (net tons)
August	5,782,096	48,661	5,830,757
September	6,095,865	68,500	6,164,365
9 mos.	42,494,940	411,736	42,906,676
1951			
August	6,004,641	58,112	6,062,753
September	5,827,269	62,533	5,889,802
9 mos.	52,599,762	547,130	53,146,892

Pittsburgh—Overall foundry activity continues sluggish. As a result, pig iron supply more closely balances demand. Iron producers expect comfortable volume to continue well into 1953.

Boston—While October shipments of pig iron were up slightly over the September total, seasonal increase is not normal. Melt has not increased materially and the district furnace continues to build stocks.

Buffalo—Automotive rush for castings continues in this area. Shipments of pig iron to Michigan foundries are heavy in addition to large shipments to miscellaneous manufacturers here. The gray iron market is easier with additional shopping for below-ceiling prices. The only idle blast furnace in this area is expected to be blown in soon, but another stack will go down for repairs shortly.

Cleveland—While there is no surplus of merchant iron in this area the furnaces are not under extreme pressure for shipments. Sellers, however, are having no difficulty disposing of tonnage with demand balancing furnace output. Whether lifting of the 30-day restriction on consumer inventories would result in a spurt in specifying is uncertain. For one thing, it is pointed out the heavy castings shops are showing some signs of slowing down, notably on machine tool work. On the other hand, a slight quickening of activity is noted in light castings, in some measure reflecting improvement in civilian goods demand for castings.

Youngstown—Normal operations were restored at the works of the Youngstown Sheet & Tube Co. last week when danger of a lengthy coal mine shutdown passed. The company's Hubbard blast furnace was restored to the active list and coking time at its two byproducts plants was shortened. All 25 district blast furnaces are operating.

Chicago—Although jobbing foundry business isn't doing the volume anticipated, supply of pig iron remains nip and tuck. Situation would be tight if some farm equipment foundries were not under curtailment because of labor difficulties. Of the district's 42 blast furnaces 41 are active. Republic Steel Corp. on Oct. 26 relighted its South Chicago stack which went down Sept. 7 for relining and hearth enlargement from 27 to 28-ft. Job was completed in 48 days 12 days sooner than expected.

Birmingham—Supply of foundry pig iron is below current demands in this area. Except for established customers availability is limited and little free iron in the immediate future is seen.

Los Angeles—Kaiser Steel Corp.'s Fontana Works third blast furnace, part of $65 million program is being rushed to completion, expected in April.

Fasteners . . .

Bolt, Nut, Rivet Prices, Page 175

New York—Bolt and nut makers can obtain plenty of wire rods for light fasteners for which demand has slumped, but can't come close to getting adequate supplies of the larger bar sizes for manufacturing items still in active need. They have more tickets than they can cash, especially for rounds $\frac{5}{8}$-in. and larger.

Lag in light fasteners is ascribed partly to some falling off in end-use demand, but also to inability of manufacturers to obtain major steel requirements. In the larger sizes, railroad and export requirements are off and jobber demand is a shade spotty, but structural and government demands are heavy.

Government requirements for alloy bolts and nuts are described as "tremendous." Much tonnage is going into tanks, gun mounts, etc. Also, there is a brisk government demand for carbon bolts. At present, the ordnance department is inquiring for a large assortment of fasteners, including 4 million pieces of carriage bolts, of one size, 5/16 by $1\frac{3}{4}$-in. with bids closing Nov. 4.

Decline in export demand is due partly to keen competition from France and Belgium. Belgian interests recently under-cut prices on tonnage for South America by more than 20 per cent. In addition, European bolt and nut makers are competing in the seaboard markets here, underselling manufacturers by 10 to 15 per cent. Sweden, Japan and West Germany also are offering stiff competition here on screws.

Semifinished Steel . . .

Semifinished Prices, Page 171

Cleveland—First heat from the last of four new open hearths at Republic Steel Corp.'s plant here was tapped last week. Each of the new furnaces has a capacity of 275 tons of steel per heat. Capacity added by these four new furnaces is 672,000 net tons a year. This boosts the Cleveland plant's annual capacity to 2,572,000 net tons.

Scrap . . .

Scrap Prices, Page 178

Chicago—With steelmaking here at 111 per cent of capacity the question is how long can new buying of scrap be deferred. Such high operations will bite heavily into inventories and winter isn't far away when scrap flow will be adversely affected. Foundry scrap continues listless because of over-generous supply and spotty foundry operations. Occasional tonnages of select material command ceiling price but for most part shading of $2 to $4 is the rule.

Washington—Closing down of the steel mills during the strike of last June-July resulted in a substantial increase in consumers' stocks of scrap, the Bureau of Mines reports. Purchased scrap stocks totaled 4,724,411 gross tons at end of July, largest since Jan. 31, 1944. Home scrap stocks amounted to 1,159,623 gross tons, increase of 23,825 over the previous month.

Purchased scrap consumption in July totaled 1,156,296 gross tons, decrease of 12,806 from June. Home scrap consumption was 808,711 gross tons, decrease of 71,138 from June.

Scrap used in steelmaking furnaces totaled 1,254,560 gross tons in the month. The melt consisted of 69 per cent scrap and 31 per cent pig iron.

Boston—Steel scrap is reaching yards in about the same volume tonnage is moving to consumers. Prices are at ceiling. Cast grades are slow and weak; prices nearly $10 under ceiling for some grades having reached the point where some buying is being done for shipment to eastern Pennsylvania.

Buffalo—Three leading scrap consumers here hold substantial stockpiles, averaging about 90 days. Prices give no indication of backing away from ceiling levels on steelmaking grades but dealers appear a bit confused by an extension of the embargo on shipments by a leading consumer. The cast market continues soft with prices $2 to $3 per ton below ceiling.

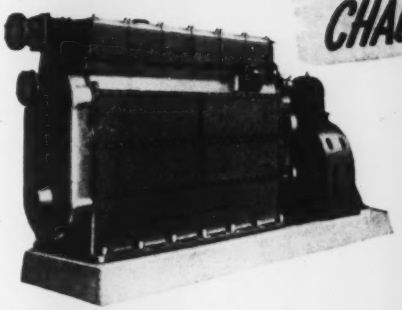
Philadelphia—District mills aren't pressing for scrap, but major grades move well and most buyers take anything good offered them. Dealers still ship material about as fast as they get it and haven't been able to add to stocks. Production scrap is moving well again. A little cast scrap is moving into the district from New England where the market is weaker.

Cleveland—District steel mills are taking scrap in steadily despite comfortable stockpiles. Heavy melting grades are moving well but turnings are sluggish. Ceiling prices prevail generally, except on some of the less desirable cast grades, tonnage pur-

Security Studloc

LOCK IT where you want it!

CHALLENGE US!



Chicago Pneumatic Tool Company amongst other things builds Diesel Engines. Holding the adjustment against the vibration present on the valve tappet adjusting screws was a problem. Security Studlocs have been in service on Chicago Pneumatic valve tappet adjusting screws for some time and have proved their dependability for holding the adjustment setting.

SECURITY has solved the problem of keeping adjusting screws, bolts and studs *where you want them!*

The Security Studloc can be adapted to provide a positive lock in counterbores and housings or it can be keyed into work to serve as a simple lock nut.

The Security Studloc will hold its position on a bolt, adjusting screw or stud in the face of vibration that will destroy the bolt. It can be readjusted, removed and replaced any number of times without distorting or damaging the bolt and without materially reducing its holding power. All load is carried by the threads of the tapped hole not by the Studloc.

The Security Studloc is a simple, elliptical, heat treated, spring retainer of the highest quality spring steel possible to obtain. Forcing it into "round" creates a gripping power that defies any attempt to move it except by design. An ear on one side permits keying the Studloc into the plate, base or housing.

Here is the Security Locknut. It provides an unequalled answer to general fastener problems. Grueling tests by unimpeachable sources have demonstrated that Security Locknuts retain their position regardless of vibration that would destroy the bolt. Security Locknuts can be removed and re-used any number of times. If you have a fastener problem specify "Security".

Security Studlocs are serving in locking tappet adjusting screws, cylinder head studs, engine through bolts, flange screws and in solving other difficult problems where bolts or studs must be kept tight. They are available in bolt sizes $\frac{3}{8}$ in. to 3 in.

If you have a fastener problem challenge us to solve it! Send the coupon.

SPECIAL OFFER—Ask for a Security Thread Tolerance Chart. Spin the dial and you have your thread tolerance figures.

Security
The Nut You Can't Shake Loose

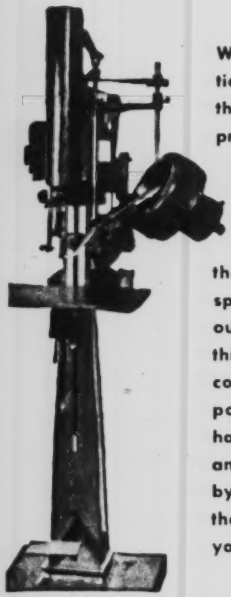
SECURITY LOCKNUT CORPORATION
North Ave. and 15th Ave., Melrose Park, Ill.

Please send me without obligation:
☐ One of your Thread Tolerance Charts.
☐ We have a fastener problem and would like to know more about Security Locknuts.

Company Name _____
Address _____
Town _____ Zone _____ State _____
Signed _____

Yes, We Can Do It!

We Can Quote on Your Application, Accept Your Order and DELIVER



We are in an enviable position whereby we can deliver the answer to your assembly problem in the form of a particular piece of equipment designed especially for your needs . . . We can do it NOW—not maybe—some time in the future. Though generally speaking, deliveries throughout industry are uncertain, and this situation probably may continue for some time, our position is different . . . We have marshalled our resources and facilities in a way whereby we can positively assure the execution and delivery of your orders without delay.

DETROIT POWER SCREWDRIVERS, HOPPER FEEDING UNITS

NUT DRIVERS, SPECIAL ASSEMBLING MACHINES

Thousands of manufacturers have profited through greatly stepped-up production as a result of our service. You, too, can benefit by the use of D. P. S. power-driven machines. Get further details. Also send sample assembly for production estimate.

DETROIT POWER SCREWDRIVER CO.

2811 W. FORT ST. DETROIT 16, MICH.

ELECTRIC FURNACE

C STEEL CASTINGS

Deliver Seven Most Important Features

Sound, clean, true-to-pattern steel castings possess:

1—**Uniform Structure** — giving greater strength throughout.

2—**Efficient Distribution of Metal** — for better weight-strength ratio.

3—**Wide Range of Mechanical Properties** — to fit your specific needs.

4—**Minimum Machining** — for lower production costs.

5—**Dimensional Stability** — for better fit and better performance.

6—**Ease of Assembly** — for fabrication with other parts.

7—**Toughness and Fatigue Resistance** — for longer life, less replacement.

We furnish this quality of product and by cooperating with your engineers in matters of design and pattern construction assist you to secure castings of maximum strength, minimum weight and utmost economy.

CRUCIBLE STEEL CASTING CO.

LANSDOWNE, Del. Co., PENNA.

FOR OVER 50 YEARS

MOLINE "Hole-Hog"

SPECIALLY DESIGNED

MACHINE TOOLS

HAVE CUT PRODUCTION COSTS FOR AMERICAN INDUSTRY

DRILLING
BORING
HONING
TAPPING and
Special Machines

FRONT LEVER BENCH PUNCH

This versatile hand operated punch has a capacity of 7 16" hole through ¼" steel or equal and weighs 70 pounds.

•

65 sizes of punches and dies—round, square, flat, and oval—to fit this punch are carried in stock for immediate shipment.

•

SEND FOR CATALOG SHEETS

•

Manufacturers of metal-working tools for 64 years.

T. H. Lewthwaite Machine Co., Inc.

310 East 47th Street New York 17, N. Y.

chases going at about $2 or so concession. Foundry buying shows signs of improving, reflecting inventory build-up for winter. Dealers' yard inventories are low and some traders anticipate noticeable tightening in supply when cold weather cuts down collection, preparation and shipping.

Pittsburgh — Scrap market continues quiet with most grades moving at ceiling. Severe weather points to early tightening in supplies. Truckers' strike last week halted incoming shipments to some dealers' yards.

Detroit Dealers' stocks are low but traders are not worrying about a severe shortage this winter. Model changeovers in auto plants have decreased scrap generation. Foundry demand shows little sign of strengthening.

St. Louis Driblets of scrap and rerolling rails have sent rolling mill demand to the highest point in months. Railroads have cut their rail replacement programs. Melting steel shipments are poor. Both rural and local dealers' receipts are so bad some cannot deliver in full on July and August contracts. Cast market remains slow with virtually no new sales.

Birmingham Scrap is moving to local yards in disappointing volume, especially from agricultural sources. Brokers must scurry around to meet current commitments especially for open hearth grades, a major portion of which is moving to other production centers. Cast scrap is fairly active.

Seattle—Scrap receipts at mills are equal to consumption. Although the tonnage is slightly less than a month ago it is considered satisfactory. Inventories are not showing much increase. Dealers' stocks are down due to heavy shipments the last 60 days.

Iron Ore . . .

Iron Ore Prices, Page 177

Cleveland — Despite cold weather and the fact vessel movement is delayed by the necessity for ore steaming at the head of the lakes, shipments of Lake Superior iron ore in the latest week of record registered a gain over the preceding week.

Total movement for the week ended Oct. 27 was 2,961,116 gross tons, increase of 134,218 tons over movement in the preceding week. Compared with the like week a year ago shipments were up 542,114 tons.

Season movement of ore to date now stands at 63,148,287 gross tons. This is 17,884,106 tons less than the 81,032,393 gross tons moved to Oct. 27 in the 1351 lake navigation season.

Roll Makers Seek Relief

Washington — Meeting with Office of Price Stabilization officials Oct. 20, the Cast Rolling Mill Rolls Industry Advisory Committee said their industry is in a serious price squeeze due to increased labor, materials and freight costs since establishment of ceiling prices under CPR 30.

One member's labor costs increased 13.3 per cent, fuel 6 to 11 per cent, alloys 10 to 21 per cent, scrap 10 per cent, pig iron 5 per cent and inbound freight 15 per cent. Pass-through of increased pig iron costs, it was held, is insignificant, representing only about 62½ cents a ton of the selling price of cast rolls averaging $300 a ton.

Warehouse . . .

Warehouse Prices, Page 177

Washington — Meeting with the National Production Authority for the first time in over a year, the Industrial Steel Products Warehouse Industry Advisory Committee on Oct. 20 urged decontrol of secondary products under NPA order M-6A, which action had been informally approved when the steel strike forced its shelving.

Members of the committee also recommended the restriction requiring warehouses to hold 50 per cent of incoming shipments of certain steel items for a period of 15 days be revoked or revised. Also, it was suggested change be made in regulations to permit distributors to convert hot-rolled steel bars to cold-rolled bars. At present, such conversion must be made under customer allotments.

NPA officials advised the warehouse men that the military order backlog resulting from the steel strike should be cleaned up by end of November. No improvement is in sight for delivery of round bars 2-in. and over to the warehouses, however. The situation in this area will remain tight through mid-1953. The distributors also were warned that during fourth quarter this year and first quarter next year they will not be able to get larger sizes of plates. In February and March, however, the situation with respect to strip will loosen. Strike losses resulted in a shortage of approximately 950,000 tons of structurals, according to NPA.

While NPA officials are unable to estimate what the impact of new steel capacity will be during first quarter of 1953, the opinion prevails that the new facilities will not be felt until second quarter.

Cleveland — Warehouse order volume is well maintained but unbalanced inventory position makes the satisfying of all customers' needs difficult. Mill receipts at some distributors' plants are down this month from September but the over-all tonnage received is substantial. Most sellers anticipate moderately tight supply conditions into second quarter next year. By that time it is believed tonnage availability will be pretty much in balance with demand except for such items as large size bars, heavy plates and certain structural sections. Warehouse operators are increasingly cost conscious with operating costs much higher today as compared with pre-war, success or failure of the individual operator increasingly hinging on operating efficiencies and large order volume.

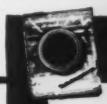
Chicago — Steel warehouses here are turning away more orders than they can accept. Despite steady mill receipts, inventories can't be pushed above 30 to 40 per cent of normal, so rapid is outgo. Items in most critical

photograph it!

A photo record is quicker, more accurate; and it may prove to be priceless.

THE ADVANCED single-lens reflex design of the 35-mm. PRAKTICA FX makes it easier for you to get expert photomicrographs, oscillographs, extreme close-ups, copy work, etc., in black and white or natural color. Use it for: Recording lab and field observations, quality control, inspections, photographing equipment in field, training personnel, etc. Excellent for the home photographer, too. From $99.50 to $199.50 (tax incl.).

The Praktica Co., Inc.,
48 W. 29 St., N. Y. 1, N. Y.



39 tested ideas Free for you!

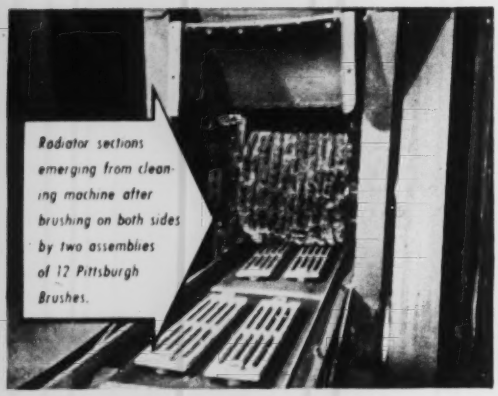
PRAKTICA FX

35-MM. SINGLE-LENS REFLEX CAMERA

The Praktica Co., Inc. Dept. H112
48 West 29th Street, N. Y. 1, N. Y.

Please send me a copy of "PHOTOGRAPHY IN SCIENCE AND INDUSTRY."

Name.....
Position.....
Company.....
Address.....
City.....Zone... State.....


Radiator sections emerging from cleaning machine after brushing on both sides by two assemblies of 12 Pittsburgh Brushes.

Pittsburgh Brushes can help you solve problems like these!

Cleaning Narrow Spaces—National Radiator Company, Johnstown, Pa., cleans 30,000 radiator sections a week! To insure a perfect final finish, even the narrowest spaces must be absolutely clean prior to assembly. Pittsburgh engineers were asked to design a brush that would reach these spaces and would fit National's existing machine. Successful? National reports: "Pittsburgh Brushes do a better job of cleaning and are more economical!"

Preparing Chills—At Continental Foundry & Machine Co., East Chicago, Indiana, chills used to cast iron rolls must be cleaned of the oxidized metal remaining from previous usage, as well as dirt and grease accumulated in storage. After experimenting with other brushes, Continental chose Pittsburgh because they "do the job better and stand up longer than any previously used!"

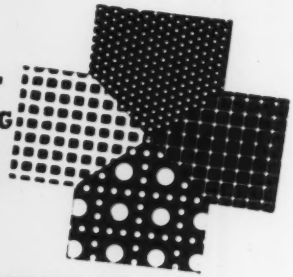
Improving Original Equipment—The Sommer and Maca Glass Machinery Co., Chicago, Illinois, uses Pittsburgh Brushes in the automatic washing machines they manufacture. Brushes formerly used simply didn't have the over all density pattern needed. Pittsburgh engineers studied the problem and designed a brush which Sommer and Maca approved "because of (its) denser bristle pattern and lower cost."

WRITE TODAY FOR FREE BOOKLET!

Write today for a free copy of our booklet that shows, through actual case histories, how Pittsburgh cuts brushing costs. Address: PITTSBURGH PLATE GLASS COMPANY, *Brush Div.*, Dept. W-11, 3221 Frederick Ave., Baltimore 29, Maryland.

PITTSBURGH
Power Driven
BRUSHES
BRUSHES • PAINTS • GLASS • CHEMICALS • PLASTICS
PITTSBURGH PLATE GLASS COMPANY

YOU GET PERFORATING PLUS



STEEL AVAILABLE FROM ACCURATE'S STOCK

ACCURATE PERFORATING GIVES YOU THESE PERFORATING **PLUS** EXTRAS

PLUS Experienced "Know How"
PLUS Engineering Consultation
PLUS Special Dies for Your Needs

Whether you need pinpoint perforation for a coffee filter or an ornamental grille for an ocean liner, Accurate Perforating offers all these extras PLUS—a price that's hard to beat. Write today for your free catalog on Accurate Perforated materials.

SERVING THESE INDUSTRIES:
AIRCRAFT • AUTOMOTIVE • COMMUNICATIONS • ELECTRICAL EQUIPMENT • FARM MACHINERY • HEATING • RADIO AND RADAR • RAILROADS • SHIP BUILDING • STEEL • WASHING MACHINES

IN THESE MATERIALS:
ALUMINUM • BRASS • BRONZE • COPPER • LEAD • MONEL METAL • STEEL • MASONITE • STAINLESS STEEL • PLYWOOD • PAPER

ACCURATE
PERFORATING COMPANY
1101 South Kedzie Avenue, Chicago 12, Illinois

ARTUS PLASTIC SLITTING MACHINE SHIMS

COST JUST A FRACTION OF METAL SPACERS

THE COLOR TELLS THE THICKNESS

ALWAYS RETAINS UNIFORMITY AND EVENNESS UNDER ALL NORMAL CONDITIONS

Save Time! Save Money!

INDUSTRIAL PRODUCTS SUPPLIERS
201 South Dean Street
Englewood N J

FORGINGS

HAMMERED STEEL FORGINGS

up to 6000 lbs. each

ALL TYPES

Smooth Forged Finished — Rough Turned Hollow Bored

and Heat Treated to Specifications

CRANKSHAFTS. CONNECTING RODS. SHAFTING

Roll—Gear Blanks—Pinions and Miscellaneous Forgings

BAY CITY FORGE CO.
ERIE, PA.

Over a Quarter of a Century of Dependable Service and Quality Products

supply are wide flange shapes, hot-rolled and cold-drawn bars in large diameter, and plates ¾-in. and over.

Boston—Despite shortages in some products, warehouses took in more steel during October and sales correspondingly increased. With some distributors tonnage moved was the best in months. Inventories of sheets and a few other products are slightly heavier. Heavy bars and plates are expected to be short until second quarter.

New York—Demand for warehouse steel is heavy except for a few specialties on which distributors are well stocked. Structurals, plates and cold-drawn bars move promptly. Some warehouses are building up hot-rolled sheet stocks slightly but strong demand for cold-rolled sheets keeps inventory of that grade down. Merchant wire products are moving slowly.

Pittsburgh—Warehouse stocks are in better balance than for some time. More standard material in a wider range of sizes is available. Even plate supply has improved. The only grade of sheets in good supply from warehouses is galvanized.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 175

Cleveland—Return of the miners to the pits served to remove whatever tension existed in the coke market as result of the coal strike. Oven foundry coke sellers estimate the mine work stoppage resulted in a slight spurt in demand, the increase amounting to no more than 10 per cent. Now with the miners back on the job and expectations prevailing that their wage demands will be fully met in the final settlement of the dispute with the Wage Stabilization Board, feeling in the coke trade is that demand pressure will ease, especially since the foundries generally are well supplied and the heavy castings shops show signs of slackening activity. Whether higher coal costs resulting from the miners' wage increase will be reflected in a hike in coke prices is uncertain at the moment. Sellers state demand volume will determine whether an increase in price can be effected. Currently, some out-district coke is coming into this area but in smaller volume than was the case some months back.

Pittsburgh—Anxiety over supplies of coking coal due to the coal strike faded when the miners called off the walkout. The big question now is what, if any, price increase will be permitted on coke.

San Francisco—Kaiser Steel Corp. estimates it has about six weeks' supply of coal on hand for its coke ovens and blast furnaces at Fontana, Calif. Columbia-Geneva Steel Division, United States Steel Co., reports its above-ground coal supply is comfortable.

Seattle—Negotiations are reported in progress with Japanese buyers for 500,000 tons of coal to be shipped annually from the Fernie, British Columbia, mines. The coal is suitable for coking. Japan now is buying coal from a Vancouver island mine.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

1000 tons, The Dalles, Oreg., Columbia river bridge, reported to Judson-Pacific-Murphy Co., Oakland, Cal., who had fabricated 2000 tons under an original contract; Guy F. Atkinson Co., Portland, general contractor.

500 tons, Oregon state Coquille river bridge, reported to unstated Portland fabricator; Carl M. Halvorson Inc., Portland, Oreg., general contractor.

250 tons, repairs and alterations, Union railway station, Providence, R. I., to A. O. Wilson Structural Co., Cambridge, Mass.; Gilbane Building Co., Providence, general contractor.

STRUCTURAL STEEL PENDING

885 tons, bridge, steel girder spans, Anacostia river, Washington parkway, District of Columbia; bids Nov. 6, Division Engineer, Bureau of Public Roads, Arlington, Va.; also 550 tons reinforcing bars.

250 tons, (also 50 tons reinforcing) Washington state Trinidad girder undercrossing; Lockyear & White, Longview, Wash., low $243,000 and awarded general contract on rebid.

150 tons, 150-ton traveling crane for Palisades dam; Moffett Engineering Co., Albany, Cal., low $85,855 to Bureau of Reclamation, Denver; delivery 480 days.

REINFORCING BARS . . .

REINFORCING BARS PLACED

1250 tons, Whidbey Island, Washington state naval installation, hangar buildings, etc., to Bethlehem Pacific Coast Steel Corp., Seattle; general award to Strand & Sons, Seattle.

800 tons, housing project, Franklin Field, Boston, to United States Steel Supply Co., Cambridge, Mass.; G. J. Rugo & Co., Boston, general contractor.

800 tons, St. Anthony's shrine building, Boston, to Bethlehem Steel Co.; Thomas O'Connor Co., Boston, general contractor.

300 tons, storage battery building, naval shipyard, Portsmouth, N. H., to Bancroft & Martin Rolling Mills Co., Portland, Me.; Jefferson Construction Co., Cambridge, Mass., general contractor.

225 tons, addition, New England Baptist Hospital, Boston, to Bethlehem Steel Co.; George A. Fuller Co., Boston, general contractor.

150 tons, dormitory, Williams College, Williamstown, Mass., to Northern Steel Co., Boston; George A. Fuller Co., Boston, general contractor.

REINFORCING BARS PENDING

225 tons, Washington state, Spokane county girder bridge; bids to Olympia, Nov. 6.

130 tons, Washington state highway projects; bids in.

100 tons or more, J. C. Penney Co., store building, University district, Seattle; H. S. Wright & Co., general contractors.

PLATES . . .

PLATES PLACED

3850 tons, including structurals, 225-foot sphere nuclear submarine power plant, Knolls atomic power laboratory operated by General Electric Co., West Milton, N. Y., to Chicago Bridge & Iron Co., Chicago.

PLATES PENDING

100 tons, 200,000-gallon elevated water tank, Marine Corps school, Quantico, Va.

PIPE . . .

CAST IRON PIPE PLACED

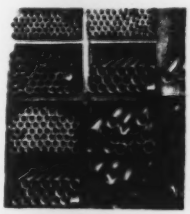
900 tons, 16-inch, St. Albans, Vt., to Warren Pipe & Foundry Co., Everett, Mass.

RAILS, CARS . . .

RAILS PENDING

Alaska Railroad, 1725 tons 115-lb rail; identical bids to General Services Administration, Seattle; Colorado Fuel & Iron Co., Minnequa, Colo., recommended for award. Same office also is considering tenders for tie plates, frogs, switches and other accessories for Alaska RR.

STAINLESS STEEL



PIPE & TUBING

from warehouse stocks

Murray warehouse stocks of stainless steel pipe and tubing are *immediately available* for prompt shipment in sizes from ⅛" O.D. to 8⅝" O.D. Special sizes from .008" O.D. up to 48" O.D. can be supplied on order. Stainless steel pipe and tube fittings are also stocked.

Other Murray products include carbon steel tubing and pipe for mechanical and pressure purposes, boiler and condenser tubes, welding and screw type fittings. Tube bending, swaging, upsetting.

WRITE FOR CURRENT TUBE STOCK BULLETIN

A B MURRAY CO INC.
ESTABLISHED 1845
ELIZABETH, N. J. McKEESPORT, PA.

7221

Get THIS BOOKLET Free!

If your industry has a problem of eliminating working hazards for crane cab operators such as extreme heat or dust and fume-laden air . . . or both . . .

. . . This new 24-page, illustrated booklet will show you how easily this can be corrected with Dravo Crane Cab Coolers and Conditioners. Booklet contents include:

- **Recommended cooling or conditioning equipment for any type crane.**
- **Installation information.**
- **Engineering specifications and data.**
- **Temperature conditions chart.**
- **Complete catalog of models and supplementary equipment.**

Dravo Crane Cab Coolers and Conditioners protect your crane cab operator, safeguard his health, increase his efficiency and alertness, and improve safety and production records in your operation. And ONLY DRAVO has a complete line of crane cab coolers and conditioners.

DRAVO
CORPORATION

PITTSBURGH • ATLANTA • BOSTON • CHICAGO • CINCINNATI
CLEVELAND • DETROIT • NEW YORK • PHILADELPHIA • ST. LOUIS
WASHINGTON

MAIL THIS COUPON FOR YOUR FREE BOOKLET
Dravo Corporation
606 Dravo Building
Fifth and Liberty Avenues
Pittsburgh 22, Penna.

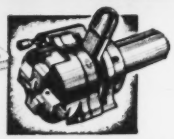
Please send me a free copy of "Dravo Crane Cab Coolers and Conditioners."

Name _____
Company _____
Address _____
City _____ Zone ____ State _____

WHEELING STEEL CORPORATION
WHEELING WEST VIRGINIA

COP-R-LOY PIPE-SHEETS
Ductilite
THE MODERN TIN PLATE
LA BELLE CUT NAILS

H&G Insert Chaser DIE HEADS



famous for accuracy and straightness of threads, less chaser costs, less downtime, more pieces per day.

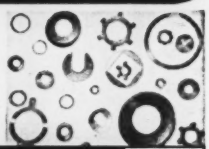
THE EASTERN MACHINE SCREW CORP., 22-42 Barclay Street, New Haven, Conn.
Pacific Coast Representative: A. C. Berbringer, 334 N. San Pedro St., Los Angeles, California. Canada: F. E. Barber Machinery Co., Toronto, Canada.

PERFORATED METALS
FOR ALL INDUSTRIAL USES
PERFORATIONS IN LIGHT SHEETS
TO HEAVY PLATES
ARCHITECTURAL GRILLES
SEND FOR CATALOG NO. 35
DIAMOND MFG. CO.
BOX 32 WYOMING, PA.

BROWNING ELECTRIC
TRAVELING CRANES AND HOISTS
up to 125-TON CAPACITY
VICTOR R. BROWNING & CO., INC. WILLOUGHBY (Cleveland) OHIO

"WHITEHEAD WILL HAVE DIES FOR THESE WASHERS"

Washers are "big business" with Whitehead. Production is fast, economical. Big runs from automatic presses. U. S. Air Corps Standard washers, U. S. and S.A.E. Standards, etc. WRITE FOR CATALOG



WHITEHEAD STAMPING CO.
1667 W. Lafayette • Detroit 16, Mich.
EST 1903

Here and There in Metalworking . . .

CONSTRUCTION—ENTERPRISE—ORGANIZATIONAL CHANGES

Worthington Expands Steel Foundry

Worthington Corp., Harrison, N. J., is installing an electric arc furnace in its steel foundry in that city. The two-ton-per-hour capacity furnace is being purchased from Pittsburgh Lectromelt Furnace Corp., Pittsburgh, and will replace an existing cupola and converter set-up. The new furnace will be able to handle larger sizes and a wider variety of iron and steel scrap. It features a swing-aside roof which is raised and pivoted for rapid top charging. Modern controls maintain a uniform high rate of melting through the use of rotary regulators. In addition to the furnace, a new charging system is being provided. The new furnace is expected to be in operation the first part of 1953.

Triangle Conduit Builds Mill

Triangle Conduit & Cable Co. Inc., New Brunswick, N. J., manufacturer of wire, cable, conduit and plastic pipe, is entering the copper and brass tubing field with construction of a mill in that city. Completion is scheduled for May, 1953.

Atlantic Steel Opens Warehouse

Atlantic Steel Co., Atlanta, opened its Warehouse Division building at 14th street and Northside drive.

Gries Reproducer Names Agents

Gries Reproducer Corp., New York, appointed C. J. McAvoy Co., Memphis, Tenn., as its representative. The firm also appointed John J. McDermott as its sales engineer in New Jersey and the metropolitan area of New York. Gries produces fastenings and other standard industrial components, including wing nuts, cap nuts, rivets, rings, button shanks, etc.

Quaker State Metals Co. Organized

Quaker State Metals Co. purchased all the manufacturing facilities and business of New Holland Metals Co., Mountville, Pa. The latter company was a division of New Holland Machine Co., both subsidiaries of Sperry Corp., New York. Quaker State Metals will continue operations at Mountville, manufacturing aluminum sheets, industrial roofing sheets, guttering and down-spouting, moulding, shapes and building accessories. Quaker State also expects to expand its production to include the manufacture of other aluminum products, as well as some steel and copper products. Quaker State Metals, an independently owned corporation, will be directed by the same group of executives who guided the operations of the old New Holland Metals Co. Officers are: R. D. Buckwalter, president; W. G. Hume, vice president and general manager; A. H. Charlton, vice president in charge of sales.

Sierra Drawn Steel Adds Equipment

Sierra Drawn Steel Corp., Los Angeles, installed a huge drawbench, the only one of its type on the West Coast, to draw rounds, squares, flats, or hexagons. Capacity ranges from $1\frac{1}{4}$ in. to $4\frac{1}{2}$ in.

Machine Maker Widens Distribution

American National Dispensing Co., a subsidiary of Central Automatic Sprinkler Co., Lansdale, Pa., appointed Cole Products Corp., Chicago, as its exclusive sales agent in the United States and Canada. American National Dispensing Co. will establish outlets in foreign countries and has secured patents covering its coffee, tea and soup automatic dispensing machines in those countries. L. M. Lewis Jr. was appointed executive vice president and assistant treasurer while Donald E. Schrader was appointed vice president in charge of production.

Hook Joins Economic Mission

Charles R. Hook, chairman, Armco Steel Corp., Middletown, O., was appointed by Charles Sawyer, secretary of commerce, to membership on a government economic mission to study industrial problems in several European countries. The mission is directed to investigate the impediments upon private investments abroad and report to the Mutual Security Agency, Washington.

Cleveland Firm To Change Name

Cleveland Graphite Bronze Co., Cleveland, will change its name, subject to approval by stockholders, to Cleveite Corp. The firm's unit which produces original equipment bearings and bushings for the automotive and other industries will be known as the Cleveland Graphite Bronze Division of Cleveite Corp.

Aircraft Armaments Builds Plant

Aircraft Armaments Inc., subsidiary of Hayes Mfg. Corp., Grand Rapids, Mich., is building an engineering and manufacturing plant in Baltimore county, Md. Manufacturing activities of Aircraft Armaments, now spread among several

When you think of

STAINLESS STEEL FASTENINGS

think first of

ANTI-CORROSIVE

Anti-Corrosive has millions of stainless steel fastenings *in stock* for immediate delivery . . . plus exceptional production capacity that can fill your requirements beyond stock items faster, *better!*

FREE — Write for Slide-Chart 525 which instantly identifies A-N nos. pertaining to stainless fastenings.

25 YEARS OF LEADERSHIP IN FASTENINGS OF STAINLESS STEEL

Anti-Corrosive Metal Products Co. Inc.

Manufacturers of STAINLESS STEEL FASTENINGS

CASTLETON-ON-HUDSON, NEW YORK

GOOD TACKLE BLOCKS protect your wire rope INVESTMENT!

MADESCO MAKES GOOD BLOCKS

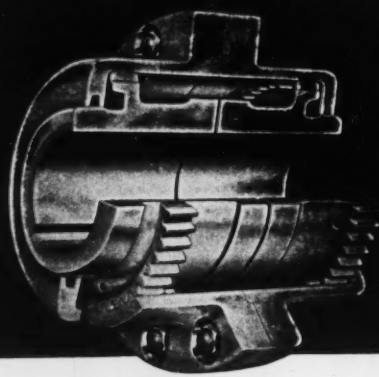
• The anti-friction bearings and bronze bushings in Madesco sheaves and blocks, combined with our quality workmanship, assure smooth performance . . . long life for your wire rope.

Madesco products can be designed for every purpose.

WRITE FOR COMPLETE INFORMATION TODAY.

MADESCO
TACKLE BLOCK COMPANY
EASTON, PENNSYLVANIA
Over a quarter century of service

POOLE



A COPY OF CATALOG GIVING FULL DESCRIPTION AND ENGINEERING DATA SENT UPON REQUEST.

FLEXIBLE COUPLINGS
POOLE FOUNDRY & MACHINE COMPANY WOODBERRY, BALTIMORE, MD.

OHIO LOCOMOTIVE CRANES

25 TO 50 TON CAPACITY

DIESEL • GASOLINE • ELECTRIC • STEAM

THE OHIO LOCOMOTIVE CRANE CO.
BUCYRUS, OHIO

THE BELMONT IRON WORKS
STRUCTURAL STEEL—BUILDINGS & BRIDGES
RIVETED—ARC WELDED Cable Address—Beliron
Engineers—Fabricators—Erectors—Contractors—Exporters
Shops—Philadelphia—Eddystone—Royersford
Main Office: Phila. 46, Pa.
New York Office—44 Whitehall St., N. Y. 4, N. Y.

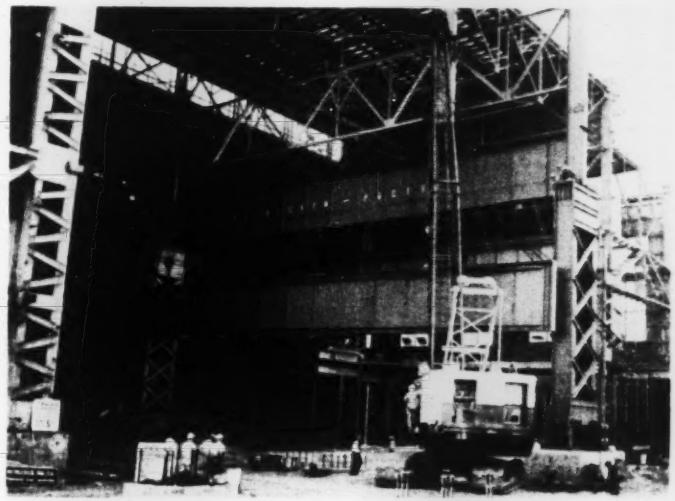
The Cleveland Steel Tool Co.
• PUNCHES • DIES • CHISELS • RIVET SETS •
IF IT'S RIVETED YOU KNOW IT'S SAFE
WE FEATURE SPECIAL PUNCHES & DIES
660 E. 82nd ST., CLEVELAND, O.

HIGH SILICON IRON.
"JISCO"

SILVERY PIG IRON
A Blast Furnace Product made from only Virgin Ores
THE JACKSON IRON & STEEL CO. • JACKSON, OHIO

IF METALWORKING PLANTS ARE YOUR PROSPECTS . . .

STEEL can put you in touch with the important ones, those that do more than 92% of the industry's business. Tell the buyers and specifiers in these plants of the machines or materials you have for sale through an "Equipment—Materials" advertisement. For rates write STEEL, Penton Building, Cleveland 13, Ohio.



Girder Becomes Open Hearth Backbone

A look-in on construction of Kaiser Steel Corp.'s No. 9 open hearth at its Fontana, Calif., plant, above, shows workmen putting into place a 66-ton girder. Bethlehem-Pacific Coast Steel Corp. has utilized 1100 tons of structural steel in carrying out the erection. The new furnace will add 156,000 tons of steel ingots to Fontana's annual production. Planners expect operation by yearend

plants in northwest Baltimore, will be consolidated at the new location.

Precision Castings Firm Opens Plant

Whitehall Precision Castings Division, Michigan Steel Casting Co., Detroit, is operating its plant at Whitehall, Mich. The new plant is designed for efficient straight-line production of precision castings and will supplement the firm's Detroit operations. The plant, which will produce 700 molds a day, has complete finishing, metallurgical and radiographic facilities.

Firm Consolidates New York Offices

Templeton, Kenly & Co., Chicago, manufacturers of mechanical and hydraulic jacks, consolidated its New York domestic and export offices. E. A. Zimmerman will direct both operations in new quarters at 60 E. 42nd St., New York.

Parker Appliance Appoints Agent

Parker Appliance Co., Cleveland, appointed Ardun Supply Co., Tulsa, Okla., as its distributor of industrial tube fittings and tube fabricating tools in that area.

T. C. & I. To Expand Zinc Works

Tennessee Coal & Iron Division, U. S. Steel Co., is doubling production capacity of its Jefferson City, Tenn., zinc works. The expansion project is scheduled to be completed about Jan. 1. Already one of the largest producers of zinc concentrates in the South, the plant is presently processing 1100 tons of raw ore and turning out for shipment some 66 tons of zinc concentrates a day.

Acker Drill To Build Plant Addition

Acker Drill Co., Scranton, Pa., received a building permit for erection of an addition to its plant. The addition will be used for offices and general factory purposes.

Kropp Forge Forms Engineering Unit

Kropp Forge Co., Chicago, established Kropp Engineered Products to handle the finishing and fabricating work on all forgings produced by the company. The new activity will be housed at 4701 W. 16th St., Cicero, Ill. It will have a separate research and engineering department.

Eagle Chemical To Build Plant

A site at the Alabama state docks, Mobile, Ala., has been leased by Eagle Chemical Co., Joliet, Ill., for a plant to manufacture desiccants and anti-corrosive protective materials. The plant will be in production in mid-November.

Stampings Firm Marks 30th Year

Dayton Rogers Mfg. Co., Minneapolis, is celebrating its 30th anniversary. The company specializes in producing precision die-cut stampings in small lots. An average of 450 to 500 new designs are made every month.

Basic Tool Industries Organized

Basic Tool Industries Inc., 4156 S. Main St., Los Angeles 37, was formed to manufacture aircraft tools, dies, jigs, and fixtures. L. C. Wiemken is owner.

Randall Establishes New Division

Randall Corp.—aluminum fabrication—with plant at Arbutus, Md., acquired an interest in Murray Corp.—aircraft parts, etc.—at Towson, Md. The latter will be known as the Murray Products Division, Randall Corp. A. J. Murray is chairman of

MATHEWS
CONVEYERS

Since 1905. Engineers and manufacturers of Conveyers and Conveyer Systems for the Metal-working Industries.
Three modern plants. Engineering Offices in All Principle Cities. There's an Engineering Sales Office near you.

MATHEWS CONVEYER CO.
ELLWOOD CITY - PENNSYLVANIA
SAN CARLOS - - CALIFORNIA
PORT HOPE - ONTARIO, CANADA

DESTACO
DETROIT STAMPING COMPANY
PRECISION • VOLUME • SPEED • ECONOMY
Small and Intricate to Medium Heavy Stampings
Detroit Stamping Company • 359 Midland Ave. • Detroit 3, Mich.

the board. H. Alexander Smith, president, and Blanchard Randall Jr., executive vice president. Randall Corp. will continue to operate under that name at Arbutus.

Parker Rust Proof Co. Opens Plant

Parker Rust Proof Co., Detroit, opened a manufacturing plant at Mountain View, N. J. Establishment of the Mountain View plant completes the company's expansion of manufacturing facilities. The original plant at Morenci, Mich., has been doubled in size and production capacity. The West Coast is served from its Maywood, Calif., plant; Canada from its Windsor, Ont., plant.

U. S. Steel Expands Container Plant

U. S. Steel Co., Pittsburgh, has virtually completed an expansion and modernization program at its Products Division plant at Petroleum, O. The program has added about 35 per cent to the overall capacity of the plant, as well as improving efficiency. It included construction of five buildings, rearrangement of production lines, and installation of a cleaning and phosphatizing line, and erection of a boiler room. The plant makes pails, barrels and stainless steel drums.

Harnischfeger Opens Branch in South

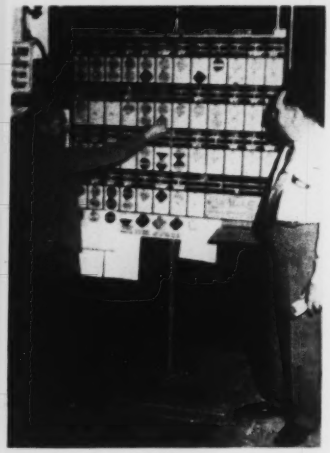
Harnischfeger Corp., Milwaukee, officially opened its new sales office, warehouse and service station at 1629 Vanderbilt Rd., Birmingham. Ray M. Calkins is in charge of the new facilities.

Metal Fabricators Organize

Metal Fabricators' Association, Minneapolis, was organized to exchange technical knowledge; to keep members abreast of new developments, ideas and equipment in metal fabricating and short cuts in production; etc. It is of particular interest to men engaged in drawing, stamping, shearing, press brake work, forming, and other phases of metal fabricating work. Officers are: M. B. Wilcox, Foley Mfg. Co., president; Carl Berg, American Machine Tool, vice president; Ray Jensen, Stremel Bros. Mfg., secretary-treasurer, all of Minneapolis. Chairmen of committees are: Chet Hanson, C. O. Hanson Co., arrangements; R. E. Lonsdale, A & L Laboratories, publicity, both of Minneapolis, and Ken Burns, Donaldson Co., membership, St. Paul.

Macklin Co. Appoints Distributor

Macklin Co., Jackson, Mich., appointed Independent Foundry Supply Co., Los Angeles, as a distributor of its grinding wheels and abrasive products in that area. Union Hardware & Metal Co., Los Angeles, continues to handle Macklin products in the same area. A. L. Waite, who has represented Macklin for many years in the Los Angeles area, was appointed manager of all sales on the West Coast by M. T. Hunt, president, Macklin Sales Co.



Tinted Tags Tell The Tale

Colored tags which save 180 machine-operating hours each month are the pride of Lockheed Aircraft Corp.'s Burbank, Calif., plant. Kaleidoscopic shaped discs graphically show status of all machine projects. A creation of two Lockheed employees, the master control board eliminates complicated manual filing systems and saves time

Truscon Loses Corporate Identity

Truscon Steel Co., Youngstown, gave up its corporate identity and became a division of Republic Steel Corp., Cleveland. The Youngstown plant becomes the Truscon Steel Division of the parent company while the Cleveland plant becomes the Pressed Steel Division. Truscon district offices will continue to report to the Truscon headquarters in Youngstown and will not be merged with Republic district offices.

Automotive Trim Maker Builds Plant

National Automotive Fibres Inc., Detroit, is expanding its operations in Canada. The firm's subsidiary, Canadian Automotive Trim Ltd., is building a plant in the Ajax area, just east of Toronto, Ont. The plant will represent an investment of about $1 million for building and equipment which will produce automobile interior trim and seat covers. The company's present plant in Windsor, Ont., will continue to serve the automobile industry in that area.

Machinery Maker Expands Operations

F. A. Lazenby Co., Baltimore manufacturer of textile machinery, is adding to its regular line a new department to include gear and sprocket manufacturing. New interests acquired control of the company, changing its name from F. A. Lazenby & Co. to the above title.

Drop Forger Appoints Sales Agents

Special Products Division, Interstate Drop Forge Co., Milwaukee, appointed as its sales agents: Louis W. Appell Co., New York; Fred W. Smith, Buffalo; William Abely, Needham Heights, Mass.; and Merrell Wood, Cleveland.

McKinnon Industries Opens Foundry

McKinnon Industries Ltd. opened its new foundry at St. Catharines, Ont. The new foundry covers about 365,000 sq ft of floor space. It is completely self-contained with its own power house, water system and sewage disposal plant. It is located close to the Welland canal where docking facilities eventually will be provided.

Jefferies Engineering Changes Name

Jefferies Engineering Co., Westfield, N. J., changed its name to Engineering Corp. of America. The firm specializes in the designing and building of special mechanical and process equipment for the chemical and petrochemical process industries.

WORLD'S LARGEST INVENTORY
FREE CATALOG
MOTORS GENERATORS TRANSFORMERS
ELECTRIC EQUIPMENT CO.
P. O. BOX 51, ROCHESTER 1, N. Y.

THREADED Rods
10 to 12 ft. lengths
ALL METALS
Also Screw Machine Products to Order
EASTERN
Machine Screw Corp.
New Haven, Conn.
Makers of H & G Die Heads

REBUILT AND NEW
GUARANTEED MOTORS
M.G. SETS • GENERATORS
Hoists • Compressors • Transformers
Units of Every Size and Description
WE'LL SELL, BUY OR TRADE
PHONE CANAL 6-2900
CHICAGO Electric Co
1334 W. CERMAK ROAD
CHICAGO 8, ILL.

RAILROAD EQUIPMENT—*FOR SALE*

USED **AS IS** **RECONDITIONED**

STANDARD GAUGE FREIGHT CARS

Box, Double Sheathed, 50-Ton Capacity
Box, Single Sheathed, 50-Ton
Flats 40- and 50-Ton, Steel Underframe, 40'0"
Gondolas, Composite, 40-Ton Capacity
Gondolas, Composite, or All Steel, 50-Ton and 70-Ton
Hoppers, Covered, All-Steel, 70-Ton
Hoppers, Twin, All-Steel, 50-Ton, Cross Dump
Hoppers, All-Steel, 70-Ton, Cross Dump
Tank, 3,000-Gallon, High Pressure
Tank, 8,000-Gallon, Coiled and Non-Coiled

EXTRA LONG FLAT CARS

40 & 50-Ton Capacity, Length 70' and 74'

CABOOSE CARS

Eight Wheel, Cupola Type

STANDARD GAUGE AIR DUMP CARS

Side Dump, 20-Yd., 40-Ton, Lift Door
End Dump, 20-Yd., 50-Ton Drop Door
End Dump, 10-Yd., 30-Ton Lift Door

OTHER EQUIPMENT

Locomotive Cranes
Overhead Cranes
Railroad Track Scales

STANDARD GAUGE DIESEL-ELECTRIC ROAD SWITCHING LOCOMOTIVE

1500 H.P., 120-Ton, Type 0-4-4-0

Send us your inquiries — WE BUY FREIGHT CARS FOR DISMANTLING — *Send us your offerings*

IRON & STEEL PRODUCTS, INC.

REPAIR PARTS For All Types of Freight Cars

General Office
13462 S. Brainard Ave.
Chicago 33, Illinois
Phone: BAyport 1-3456

New York Office
50-D. Church Street
New York 7, N. Y.
Phone: BEekman 3-8230

STORAGE TANKS
6,000 Gallon
8,000 Gallon
10,000 Gallon

"ANYTHING containing IRON or STEEL"

CLASSIFIED ADVERTISING

Help Wanted

INDUSTRIAL ENGINEER

Wanted by small Rolling Mill. Must be experienced in all phases of Industrial Engineering work. Prefer man with Steel Plant background. Write Box 597, STEEL, Penton Bldg., Cleveland 13, Ohio.

ESTIMATOR—Midwest steel and alloy plate fabrication shop desires a mechanical engineer, experienced in estimating labor and material of tanks, piping, ducts, etc. Confidential. State age, former employers, education, experience and salary required. Address Box 596, STEEL, Penton Building, Cleveland 13, Ohio.

METALLURGIST

Recent graduate wanted by Pittsburgh bar and tubing fabricator. Laboratory and processing control and metallurgical contact involved. Good future for one with initiative. Give age, education, experience and salary expected. Our personnel know of this advertisement. Write Box 589, STEEL, Penton Bldg., Cleveland 13, Ohio.

METALLURGIST—With Sales or Engineering contact experience. Familiar with Stainless Steel Bars, Sheets, Tubes, etc. Will be required to travel in Eastern States. Position open with large Eastern Stainless Steel Distributor. Write giving age, qualifications, salary, etc. Address Box 595, STEEL, Penton Building, Cleveland 13, Ohio.

REFRACTORIES & CHEMICAL SALESMAN. Between the age of 28 and 35. By large producer of basic refractories and industrial chemicals. Steel mill experience in either metallurgy or ceramics preferred. Must be willing to relocate if necessary. Write Box 587, STEEL, Penton Bldg., Cleveland 13, Ohio.

Opportunities

For Sale or Investment
Small Cutting Tool Business

A small business engaged in the manufacture of special machine knives, having the necessary machine tools, patterns and dies is available for sale. This line of tools would be a good addition to an established tool company. We are interested either in selling as a unit or in securing additional capital to further develop this line. Write Box 592, STEEL, Penton Bldg., Cleveland 13, Ohio.

Employment Service

SALARIED POSITIONS $3,500 TO $35,000. WE offer the original personal employment service (established 42 years). Procedure of highest ethical standards is individualized to your personal requirements. Identity covered; present position protected. Ask for particulars. R. W. HIXBY, INC., 110 Dun Bldg., Buffalo 2, N. Y.

Positions Wanted

PLANT MANAGER: M.I.T. GRADUATE WITH 25 years' experience in Plant Management, including Production planning, machine and plant loading, Material and tool control, quality control, purchasing, incentives, standard costs, variable budgets, overhead analysis and break-even charts, job evaluation, supervisory responsibility chart and labor relations. Capable administrator with excellent record. Write Box 559, STEEL, Penton Bldg., Cleveland 13, Ohio.

SALES OR ADMINISTRATIVE position wanted by man with varied and extended experience in power press and machinery fields. Can handle sales and advertising, development of direct sales and dealer organizations and government relations. Excellent record on promotion and sales. Experienced in dealing with government both in World War II and Korean emergency. Now completing six months of service with government agency on loan from major company. Circumstances beyond my control make it desirable to seek challenging new position in line with my capabilities. Write Box 599, STEEL, Penton Bldg., Cleveland 13, Ohio.

Immediate Openings for Metallurgists and Foundry Men

We now have positions available in practically all fields, including technical service and sales. Salaries range from $4,000 to $8,000. Openings in all sections of the country. Write or phone for full particulars. Your inquiry held in confidence.

EMPLOYERS SERVICE BUREAU
Phone: Financial 6-1155
6 N. Michigan Ave., Chicago 2, Ill.

FOR SALE

3—8" x 12" United 2-High Cold Mills with Combination Pinion Stands and Gear Sets; D. C. Motor Drives; Coilers.

FRANK B. FOSTER, INC.
2220 Oliver Building — Pittsburgh 22, Pa.
Cable Address "Foster Pittsburgh"

BORING MILLS 48" and 72" Gisholt.
BULLDOZERS, No. 25 and 27 W. & W.
GRINDER, Thompson, 10 x 36" Univ. M.D.
LATHE, 42" x 30' Putnam, M.D.
PRESS, TRIMMING, No. 6 W & W, #73 ½ Bliss.
SHEAR, 140" x ⅜", E. W. Bliss.

WEST PENN MACHINERY COMPANY
1210 House Bldg. — Pittsburgh 22, Pa.

OPEN TIME
300 TON PRESS BRAKE
Will bend 20' x ¼" to 6' x ¾" Pl.
ST. JOSEPH STRUCTURAL STEEL CO.
Box 68 Sta. "A" St. Joseph, Mo.

WANTED TO BUY
SEAMLESS STEEL TUBING
4000'—10¾ 31.2
12100'—8⅝ 24.7
and additional quantities.
PHIL BRADY COMPANY, FAIRHOPE, ALABAMA

Wanted
FORGING SUPERVISOR

Experienced in operation of Board Drop Hammers 800 to 3000 lb. size and related equipment. Excellent opportunity with well established firm. Please state qualifications in detail.

Write Box 591, STEEL,
Penton Bldg. Cleveland 13, Ohio

PROTECT SHEETS AND FABRICATED METAL PRODUCTS WITH TOUGH, WATERPROOF

FIBREEN

AT LOW COST!

PROTECTS from damage against excessive moisture, grit, dust, and rough handling in transit or storage. Dependable. Economical. Easy to handle.

Roll widths from 36" to 96"

SAMPLES on request. Write Dept. S-11

THE SISALKRAFT CO.
Chicago 6 • New York 17 • San Francisco 5

EUREKA FIRE BRICK WORKS
Works: Mt. Braddock, Fayette Co., Pa.
Dunbar, Pa.—4213

Patent Covered Hot Tops and Bottom Plugs for Ingot Molds for Alloy Steels

Beehive Coke Ovenbrick. Edge Pressed Brick for accurate sizing.

Difficult Shapes a Specialty

Sales Office:
205 Highland Bldg.
PITTSBURGH 6, PA.

ABBOTT Deep Hardened and Tempered Carbon Steel

BEARING BALLS

BURNISHING MATERIALS •
• TUMBLING BARRELS

THE ABBOTT BALL CO.
65 Railroad Place, Hartford, Conn., U.S.A.

Aluminum Cable Moves in on Copper Plant

A stranded aluminum steel-reinforced conductor is cabled at the Great Falls, Mont., mill of Anaconda Wire & Cable Co. while reels of copper cable stand in background. Machines above, which once produced only copper wire and cable products, now turn out aluminum conductors also. Anaconda plans increased output here together with a new primary aluminum plant at Columbia Falls, Mont.

American Machine & Foundry Expands

American Machine & Foundry Co. leased 75,000 sq ft of floor space in a Buffalo warehouse to make more space available at its plant in Cheektowaga, N. Y. The leased space will be used primarily as a parts distribution center. Shifting of spare parts activity from the main plant will make about 30,000 sq ft available for additional manufacturing.

Awning Firm Opens Baltimore Plant

Koolvent Aluminum Awning Corp., Baltimore, opened a plant at 2426 St. Paul St. and an office at 2117 N. Charles St. S. D. Dorfman is local manager.

Aluminum Import Corp. Opens Branch

Aluminum Import Corp., sales distributor in the United States for Aluminum Co. of Canada Ltd., opened a branch sales office at 505 Terminal Tower, Cleveland. James M. Wells is in charge of the office.

Tool Engineers Sponsor Research

American Society of Tool Engineers, Detroit, established a national Tool Engineering Research Foundation to carry out scientific research projects in the fields of manufacturing—manufacturing processes and allied tool engineering subjects. Trustees of the foundation are: Roger E. Gay, president, Bristol Brass Co., Bristol, Conn.; David A. Wallace, president, Chrysler Division, Chrysler Corp., Detroit; Robert B. Douglas, president, Godscroft Industries & Specialloid Inc. Ltd., Montreal, Que.; John Slezak, president, Turner Brass Co., Sycamore, Ill.; and Louis F. Polk, president, Sheffield Corp., Dayton, O. Additional trustees will be elected until a total of 15 is reached.

Joseph H. Thompson Christened

Joseph H. Thompson, the longest ship on the Great Lakes, was christened last week in Chicago. She is expected to make several trips up the lakes as a unit of the Hanna fleet before the season's shipping is halted. The *Joseph H. Thompson*, named after the president of M. A. Hanna Co., is 714 ft 1.25 in. long, 71 ft 6 in. wide, and has a molded depth of 38 ft 6 in. She is powered by a 6000 hp steam turbine and has a capacity of 18,500 gross tons at a 24-foot draft. She is jointly owned by Hanna Coal & Ore Corp., Sand Products Corp. and Wheeling Steel Corp.

Acme Metal Erects Plant Addition

Elmer Reese, owner of Acme Metal Products Co., Wilkes-Barre, Pa., is erecting an addition to his plant.

Volkswagen Probes Canadian Market

The German Volkswagen Co. plans to establish an automobile assembly plant soon in the Toronto, Ont., area. The company has established a national car headquarters in Canada, and plans call for the establishment of the assembly plant when sales reach a certain point.

Advertising Index

Abbott Ball Co., The 196
Accurate Perforating Co. 188
Air Products, Inc. 84
Ajax Electrothermic Corporation 39
Ajax Engineering Corporation 131
Alan Wood Steel Co. 103
Alliance Machine Co., The 150
Allis-Chalmers 14, 15
American Hoist & Derrick Co. 52
American Screw Co. 44
American Wheelabrator & Equipment Corp. 134
Anaconda Wire & Cable Co. 133
Anti-Corrosive Metal Products Co., Inc. 191
Armco Steel Corporation 58
Associated Spring Corporation 29
Atlantic Screw Works, Inc. 44

Barium Steel Corporation 37
Barnes-Gibson-Raymond, Division of Associated Spring Corporation 29
Barnes, Wallace, Co., Division of Associated Spring Corporation 29
Barnes, Wallace, Co., Ltd., The, Division of Associated Spring Corporation 29
Bath, Cyril, Co., The 158
Bay City Forge Co. 188
Belmont Iron Works, The 192
Bethlehem Steel Co. 1
B-G-R Cook Plant, Division of Associated Spring Corporation 29
Bixby, R. W., Inc. 195
Blake & Johnson Co., The 44
Bliss & Laughlin, Inc. 30
Browning, Victor R., & Co., Inc. 190
Bullard Co., The 76

C & H Manufacturing Co., Metal-Cal Division 139
Camcar Screw & Mfg. Corp. 44
Carborundum Co., The 142, 143
Carpenter Steel Co., The 49
Central Screw Co. 34, 44
Central Steel & Wire Co. 41
Chandler Products Corp. 104
Chase Brass & Copper Co. 125
Chicago Electric Co. 194
Cincinnati Milling Machine Co., The 112, 113
Clark Controller Co., The 26
Clark Equipment Co., Industrial Truck Division 127
Cleveland Steel Tool Co., The 192
Cleveland Worm & Gear Co., The Inside Back Cover
Cold Metal Products Co., The 109
Continental Screw Co. 44
Copperweld Steel Co. 79
Coulter, James, Machine Co., The 40
Crucible Steel Casting Co. 186
Curtis Pneumatic Machinery Division of Curtis Manufacturing Co. 43
Cutler-Hammer, Inc. Back Cover

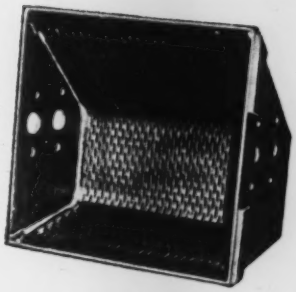
Denison Engineering Co., The 7
Detroit Power Screwdriver Co. 186
Detroit Stamping Co. 193
Diamond Mfg. Co. 190
Dodge Manufacturing Corporation 48
Drave Corporation 139, 190
Drop Forging Association 119
Dunbar Bros. Co., Division of Associated Spring Corporation 29
Duraloy Co., The 162

Eagle Lock Co., The 44
Eastern Machine Screw Corp., The 190, 194
Easton Car & Construction Co. 130
Eaton Manufacturing Co., Reliance Division 90
Elco Tool & Screw Corp. 44
Electric Controller & Mfg. Co., The Inside Front Cover
Electric Equipment Co. 194
Electro Dynamic, Division of General Dynamics Corporation 25
Electro Metallurgical Co., A Division of Union Carbide & Carbon Corporation 46
Electro Refractories & Abrasives Corporation 160
Elgin National Watch Co., Abrasives Division 5
Emhart Mfg. Co., The V & O Press Co. Division 136, 137
Employers Service Bureau 195
Eureka Fire Brick Works 196

Fairbanks, Morse & Co. 47
Farrel-Birmingham Co., Inc. 126
Federal Machine & Welder Co., The 146
Firestone Steel Products Co. 61
Follansbee Steel Corporation 149
Foster, Frank B., Inc. 195

Continued on following page

Typical of Hendrick's **Manufacturing Facilities**



Hendrick is exceptionally well equipped to manufacture to specifications a wide range of metal products that involve such operations as perforating, shaping, forming, welding, brazing, riveting, etc. The perforated elevator bucket illustrated is typical of the many specialized articles for whose fabrication Hendrick has unusual facilities. Write us in detail regarding any metal product you desire fabricated.

SEE OUR CATALOG IN SWEET'S

HENDRICK

Manufacturing Company

30 DUNDAFF STREET, CARBONDALE, PENNA.

Sales Offices In Principal Cities

Perforated Metals
Perforated Metal Screens
Wedge-Slot Screens
Architectural Grilles
Mitco Open Steel Flooring,
Shur-Site Treads, Armorgrids

Collapsible pallet-box plus Gerrard Steel Strapping helps cut shipping costs!

● The collapsible pallet-box shown here carries 3450 lbs. of front axles. Gerrard Round Steel Strapping reinforces all six sides of the container, keeping the box rigid and the contents safe until they reach their destination. When the box is unloaded and all straps removed, the box may be quickly collapsed and its members strapped together for return shipment. Costly shipping space is thereby conserved.

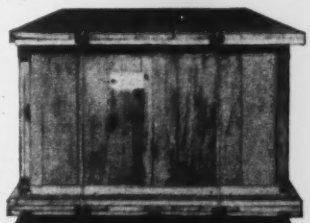


Photo courtesy of International Harvester Company, Industrial Power Division.

Call a Gerrard engineer for detailed information about how the Gerrard Method of Strapping can help you cut shipping costs, speed up production line tying, eliminate unnecessary containers or give stronger reinforcement to cartons, boxes, crates and pallets. Write for a free copy of the *Blue Book of Packaging.*

GERRARD STEEL STRAPPING DIVISION, UNITED STATES STEEL COMPANY
4745 South Richmond St., Chicago 32, Ill.

U·S·S GERRARD ROUND STEEL STRAPPING

USS

UNITED STATES STEEL

NOW you can

BRIGHT-ANNEAL STAINLESS

on a continuous production basis, with

The

SARGEANT & WILBUR

Controlled Atmosphere

CONVEYOR FURNACE

PARTS MADE OF STAINLESS can be

BRIGHT-ANNEALED,

BRIGHT-HARDENED, or

BRIGHT-BRAZED without oxidation . . . they come out scale-free, bright, and clean. No pickling required, no tumbling, no sand blasting.

With our special S. & W. alloy for bright-brazing stainless, the color matches the metal, resists dulling; and the joint is practically invisible. *Gold and silver parts are soldered in the same continuous-production furnace with equal success.*

Your samples processed free. If you want to see some of your own work bright-annealed, bright-hardened, or bright-brazed in a *conveyor furnace*, send us samples and specifications.

SARGEANT & WILBUR, INC.
180 Weeden St.
PAWTUCKET, R. I.

Send your illustrated folder "How to BRIGHT-ANNEAL STAINLESS in the S. & W. Conveyor Furnace."

Name .....

Company .....

Address .....

Representatives:
NEW YORK CITY and PENNSYLVANIA Gerald B Duff, 68 Clinton Ave., Newark, N. J. MICHIGAN and NORTHERN OHIO M. C. Schwar, 2970 W. Grand Blvd., Detroit 2, Mich.; NEW ENGLAND James J. Harkin, 180 Weeden St., Pawtucket, R. I.

Advertising Index

Concluded from preceding page

General Dynamics Corporation, Electro Dynamic Division 25
General Electric Co. 35
Gerrard Steel Strapping Division, United States Steel Co. 197
Gibson, William D., Co., The, Division of Associated Spring Corporation 29
Gisholt Machine Co. 17, 18, 19, 20
Goodyear Tire & Rubber Co., Inc., The 4
Gordon, Claud S., Co. 6
Gorham Tool Co. 12
Great Lakes Screw Corp. 44

Hanson-Van Winkle-Munning Co. 45
Harnischfeger Corporation, Welding Division 50
Harper, H. M., Co., The 44
Haynes Stellite Co., A Division of Union Carbide & Carbon Corporation 180
Hendrick Manufacturing Co. 197
Hinde & Dauch 124
Holcraft & Co. 138
Holliday, W. J., & Co. 141
Houghton, E. F., & Co. 32

Industrial Products Suppliers 188
Ingalls Iron Works Co., The 111
Ingersoll-Rand 123
Iron & Steel Products, Inc. 195

Jackson Iron & Steel Co., The 192

Kaiser Steel Corporation 53
Keokuk Electro-Metals Co. 155
Kidde, Walter, & Co., Inc. 10

Laclede Arch Co., Division of Laclede-Christy Co. 114
Lamson & Sessions Co., The 44
Landis Machine Co. 2
Landis Tool Co. 11
Leake Stamping Co., The 135
Lebanon Steel Foundry 16
Leeds & Northrup Co. 36
Levinson Steel Co., The 101
Lewthwaite, T. H., Machine Co., Inc. 186
Linde Air Products Co., A Division of Union Carbide & Carbon Corporation 22
Link-Belt Co. 28
Logan Co. 116
Lurie Brothers & Co., Inc. 179

McDanel Refractory Porcelain Co. 130
McKay Machine Co., The 71
McKee, Arthur G., & Co. 107

Macwhyte Co. 3
Madesco Tackle Block Co. 192
Manross, F. N., & Sons Co., Division of Associated Spring Corporation 29
Mathews Conveyer Co. 193
Mattison Machine Works 38
Metal-Cal Division, C & H Manufacturing Co. 139
Miller & Co. 155
Milwaukee Division of Associated Spring Corporation 29
Moline Tool Co. 186
Murray, A. B., Co., Inc. 189
Murray-Way Corporation, The 140

National Acme Co., The 33
National Lock Co. 44
National Screw & Mfg. Co., The 44
National Steel Corporation 159
Northern Engineering Works 129

Ohio Division of Associated Spring Corporation 29
Ohio Knife Co., The 145
Ohio Locomotive Crane Co., The 192
Osborn Manufacturing Co., The 89

Parker-Kalon Corporation 44
Pawtucket Manufacturing Co. 154
Pheoll Manufacturing Co. 44, 83
Pittsburgh Plate Glass Co., Brush Division 188
Pittsburgh Steel Co. 156
Poole Foundry & Machine Co. 192
Potter & Johnston Co., Subsidiary of Pratt & Whitney Division Niles-Bement-Pond Co. 118
Praktica Co., Inc., The 187
Production Steel Co. 72

Raymond Manufacturing Co., Division of Associated Spring Corporation 29
Reliance Division, Eaton Manufacturing Co. 90
Republic Steel Corporation 24
Rockford Screw Products Co. 44
Roebling's, John A., Sons Co. 9
Rust-Oleum Corporation 23
Ryerson, Joseph T., & Son, Inc. 62

St. Joseph Structural Steel Co. 195
Sandvik Steel, Inc. 161
Sargeant & Wilbur, Inc. 198
Scovill Manufacturing Co. 44
Screw Research Association 44
Security Locknut Corporation 185
Shakeproof, Inc. 44
Simonds Abrasive Co. 157
Sisalkraft Co., The 196
Southern Screw Co. 44
Southington Hdwe. Mfg. Co., The 44
Sperry Products, Inc. 167
Sterling Bolt Co. 44, 51
Stevens, Frederic B., Inc. 31
Stronghold Screw Products, Inc. 44
Superior Air Products Co. 144
Superior Steel Corporation 147

Texas Co., The 54
Timken Roller Bearing Co., The, Steel & Tube Division 80
Torrington Co., The 148
Transue & Williams Steel Forging Corporation 87

Union Carbide & Carbon Corporation, Electro Metallurgical Co. 46
Union Carbide & Carbon Corporation, Haynes Stellite Co. 180
Union Carbide & Carbon Corporation, Linde Air Products Co. 22
Unit Crane & Shovel Corporation 132
United States Steel Co. 197
United States Steel Corp., Subsidiaries 197

V & O Press Co., The, Division of Emhart Mfg. Co. 136, 137
Vanadium Corporation of America 168
Van Dorn Iron Works Co., The 164
Verson Allsteel Press Co. 153

Wales-Beech Corp. 44
Wallingford Steel Co., The 152
Wapakoneta Machine Co., The 122
Warner & Swasey 8
Warren Brothers Manufacturing Division Warren Brothers Roads Co. 13
Washington Steel Corporation 117
Wairton Steel Co. 159
Westinghouse Electric Corporation, Sturtevant Division 57
West Penn Machinery Co. 195
Wheeling Steel Corporation 190
Whitehead Stamping Co. 190
Wisconsin Steel Co. 42
Worcester Stamped Metal Co. 128

Yale & Towne Mfg. Co., The 163
Yoder Co., The 21
Youngstown Sheet & Tube Co., The 27

~ ~ ~

Table of Contents, Page 5

Classified Advertising Pages 194, 195

WORM GEARING—universal in its application—affords advantages for almost every power transmission job. Select worm-gear units to meet your need—small or large—from the complete line of Cleveland Worm Gear Speed Reducers. For detailed information, diagrams and rating tables on standard small Clevelands now available, write for our Bulletin 114.
Photo by courtesy of Continental Foundry & Machine Company.

CLEVELAND drive gives continuous performance

SLAB shears, working round the clock today, must have dependable drives. That's the reason so many of them—as with the Continental downcut shear and gauge shown here—are equipped with Clevelands.

In the production and fabrication of steel, Cleveland Worm Gear Speed Reducers and Worm Gearing operate a wide variety of equipment—from car dumpers and ore bridges right through the mills to heat-treat furnaces, finishing presses and loading-out cranes. In fact, wherever any industry needs a powerful, quiet, trouble-free right-angle drive, you're likely to find a Cleveland at work.

Wherever Clevelands serve—and you'll find tens of thousands of them on the job—many for 30 years and more—engineers will tell you that Clevelands will do their work under heavy loads, continuously or intermittently, no matter how severe the conditions, with a minimum of attention.

In or near your city, there's a Cleveland engineer ready to serve you. He will be glad to discuss your power transmission problems and suggest proper drives to meet your particular needs. The Cleveland Worm and Gear Co., 5270 East 80th Street, Cleveland 4, Ohio.

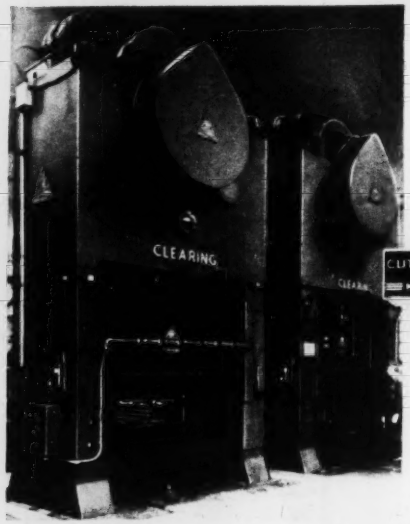
Affiliate: The Farval Corporation, Centralized Systems of Lubrication. In Canada: Peacock Brothers Limited.

CLEVELAND
Speed Reducers

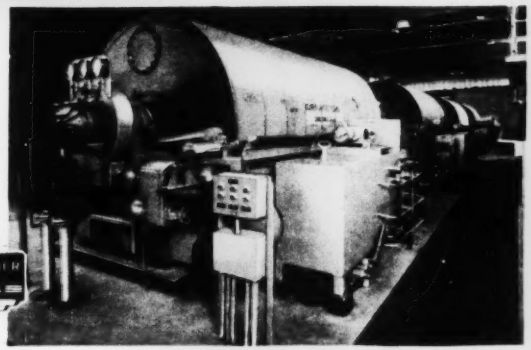
Choice of the Leaders

CUTLER-HAMMER
MOTOR CONTROL
C-H

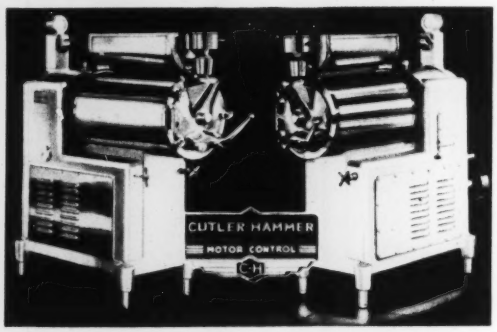
The Mark of Better Machines



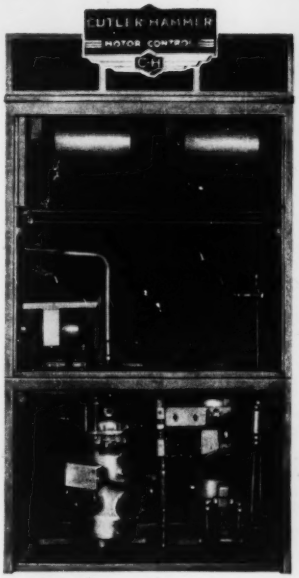
CLEARING MACHINE CORPORATION DRAW PRESSES EQUIPPED 100% WITH CUTLER-HAMMER MOTOR CONTROL.



OLIVER UNITED FILTERS INSTALLED IN LARGE SEWAGE TREATMENT PLANT AND COMPLETELY EQUIPPED WITH CUTLER-HAMMER MOTOR CONTROL.



CHERRY-BURRELL DUO-DASH SANITARY BATCH FREEZERS MADE BY CHERRY-BURRELL CORPORATION AND EQUIPPED WITH CUTLER-HAMMER MOTOR CONTROL.



AIRTEMP MODEL 1008 AIR CONDITIONER WITH PANELS REMOVED TO SHOW MECHANISM; ONE UNIT OF COMPLETE LINE MADE BY AIRTEMP DIVISION OF CHRYSLER CORP. USING CUTLER-HAMMER MOTOR CONTROL.

Proof of Dependability

The repeated selection by a leading manufacturer of a device for inclusion in his product has a lot of meaning. In all evidence the device has proved its dependability to his satisfaction. Look at the facts. The leadership of any company can only reflect the market's approval of its product. The market thus favors the product above many others . . . preferring it because of demonstrated superiority in actual use. But such position of commercial advantage is not easily won. Nor easily held. That is why leading manufacturers follow a policy of scrupulous attention to every detail influencing product performance in the user's hands. Therefore, it is important to note how frequently and continuously so many leading machinery manufacturers select Cutler-Hammer Motor Control for their machines. There can be no better proof of the dependability of this control. And no better reason for you to specify it, too. CUTLER-HAMMER, Inc., 1211 St. Paul Ave., Milwaukee 1, Wis. *Associate:* Canadian Cutler-Hammer, Ltd., Toronto, Ontario.